ADDIS ABABA UNIVERSITY

SCHOOL OF COMMERCE

DEPARTMENT OF LOGISTICS AND SUPPLY CHAIN MANAGEMENT

THE APPLICATION OF BALANCED SCORECARD AS A MEASURE OF SUPPLY CHAIN PERFORMANCE: THE CASE OF ETHIO TELECOM

A THESIS SUBMITTED TO ADDIS ABABA UNIVERSITY SCHOOL OF COMMERCE

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF ARTS IN LOGISTICS AND SUPPLY CHAIN MANAGEMENT

BY: ASHREK HAIREDIN

ADVISOR: TARIKU JEBENA (PhD)

June, 2020
ADDIS ABABA, ETHIOPIA

ADDIS ABABA UNIVERSITY

SCHOOL OF COMMERCE

DEPARTMENT OF LOGISTICS AND SUPPLY CHAIN MANAGEMENT

THE APPLICATION OF BALANCED SCORECARD AS A MEASURE OF SUPPLY CHAIN PERFORMANCE: THE CASE OF ETHIO TELECOM

BY: ASHREK HAIREDIN (GSE/0235/10)

ADVISOR: TARIKU JEBENA (PhD)

APPROVED BY BOARD OF EXAMINERS

_____	_____
Advisor	**Date and Signature**
_____	_____
Internal Examiner	**Date and Signature**
_____	_____
External Examiner	**Date and Signature**
_____	_____
Chair Person	**Date and Signature**

Declaration

I, the undersigned declare that this thesis entitled with “The Application of Balanced Scorecard as a Measure of Supply Chain Performance: The Case of Ethio Telecom” is my original work and to the best of my knowledge has not been presented or submitted for a degree at any other university. Appropriate acknowledgements are done for all the references used in the study.

Declared by: Ashrek Hairedin _____

Name **Signature and Date**

Certification

This is to certify that Mr. Ashrek Hairedin has carried out this research work entitled with “The Application of Balanced Scorecard as a Measure of Supply Chain Performance: The Case of Ethio Telecom” under my supervision. This work is original in nature and sufficient for submission for the partial fulfillment of the requirements for the degree of Master of Arts in Logistics and Supply Chain Management.

Name: Tariku Jebena (PhD)

Signature: _____

Date: _____

Acknowledgements

First of all, I thank Allah for giving me endless support throughout my life. I would like to express my sincere gratitude to my advisor Tariku Jebena (PhD) for his support and guidance throughout the research.

I am grateful to my beloved wife Mrs. Hurya Ismael for her understanding and support throughout my graduate program and this study. I am also indebted to my best friend Mr. Kedir Nuru for his follow up, support and advice in the course of this paper.

Finally, I would like to extend my special thanks for the ethio telecom supply chain division employees who participated in this study through provision of the required information during the data collection.

Table of Contents

List of Tables and Figures

Tables **Page**

Figures

Abbreviations

ABC – Activity Based Costing

ADSL - Asymmetric Digital Subscriber Line

BSC – Balanced Score Card

CRBT - Caller Ring Back Tone

ERP – Enterprise Resource Planning

EVDO - Evolution Data Optimized

IT – Information Technology

KPI – Key Performance Indicator

R&D – Research and Development

ROI – Return on Investment

SCM – Supply Chain Management

SCOR – Supply Chain Operations Reference

SCPM – Supply Chain Performance Measures

SPSS – Statistical Packages for Social Sciences

Abstract

The purpose of this study was to examine the application of Balanced Scorecard (BSC) as a measure of supply chain performance in ethio telecom. Mixed approach of using both quantitative and qualitative data was employed. Descriptive research design was used to identify the prospects and challenges of BSC in measuring the supply chain performance along with assessing the alignment of the four perspectives with the supply chain performance measures. Survey data was collected from 131 respondents from employees of ethio telecom supply chain division and six section managers were also interviewed. The data was analyzed using descriptive statistical tools such as frequency distributions and mean values using Statistical Package for Social Sciences (SPSS) software. The findings of the study revealed that the application of BSC resulted in a number of benefits such as increment in the knowledge of employees about the organization's strategy, alignment of supply chain performance measures with the four BSC perspectives of finance, customer, internal process, and learning and growth, opportunity to identify potential improvement initiatives, improved accountability, delivery time and cost reduction, quality improvement, flexibility, revenue growth, value to customers and improved partnership management. However, several challenges are also identified. These are lack of integration of the BSC with other control systems, more focus on financial measures, lack of communication and feedback from employees, failure to relate key measures of supply chain to performance drivers, lack of efficient reporting tool, lack of training and less attention on the learning and growth perspective. Therefore, the study recommends use of IT and information systems to integrate the BSC with other control systems, following balanced approach for all the four perspectives, availing communication and feedback mechanisms, periodic review of the supply chain measures to include key performance drivers and more focus on training and human development.

Key Words: BSC, ethio telecom, prospects, challenges, supply chain

CHAPTER ONE
INTRODUCTION

1.1. Background of the Study

The Balanced Scorecard (BSC) is a performance management scheme that can be employed organizations of any size to link vision and mission with customer expectations and day-to-day operations, control and evaluate business strategy, check operational efficiency enhancements, build organization capacity, and communicate progress to all employees (Mathiyalagan, Mannan & Parthiban, 2014). Measuring performance is critical for the success of organizations by evaluating whether the organization is achieving its goals. As stated by Nanni, Dixton & Vollman (1992), performance measurement is the process of assuring that a business follows strategies that results in the attainment of overall goals and objectives.

To measure their performance, organizations were using the traditional financial measures such as profits, share values, sales volume and the like. However, these financial measures ignore the non-financial aspects of the organizations such as intangible assets. Thus, they couldn't measure the overall organizational performance.

The Balanced Scorecard model was developed by Robert Kaplan and David Norton in 1992 in order to overcome the limitations of the traditional financial performance measures. The model enables measuring all aspects of the organizational performance using four perspectives of financial, customer, internal business process, and learning and growth (Kaplan & Norton, 1996). According to the authors, the model is more agile and empowering for employees as they are no longer controlled by the financial measurement systems but instead can freely take action that lead to fulfill the strategic goals and get the organization closer to its vision.

Supply Chain Management (SCM) has become a major component of competitive strategy to enhance organizational productivity and profitability (Yan and Yang, 2013). It explains the discipline of ensuring efficient delivery of goods, services and related information from supplier

to customer. It deals with the effectiveness of achieving final customer's demand by the actors engaged in the provision of the product as a whole (Cooper, et al., 1997). Thus, in order to evaluate whether the supply chain is satisfying the customer's demand, measuring the supply chain management performance is important.

The foundation of proper supply chain performance assessment system is the basis of its effective operation and management (Yan & Yang, 2013). According to Kyung (2014), supply chain performance measurement (SCPM) has taken a great role for set up the concrete strategy and a driving force for improvement in organizational productivity. Accordingly, it is essential to launch the right performance measures and measurement system to establish strategic objectives, to assess the organizational performance, and to manage the future of business goal and activities effectively. BSC is used as one of the supply chain performance management tools in different organizations.

Since its development in 1992, several organizations have adopted the Balanced Scorecard to measure their performance. Accordingly, a number of studies have been conducted to assess the implementation of the balanced scorecard in different organizations.

The BSC has been adopted by government agencies and non-profit organizations after making its first entry in private sector settings. According to Thompson and Mathys (2008), over 60% of fortune 1,000 companies applied the BSC in 2007 (cited by, Henry, 2009). The concept has been gaining popularity in Africa. However, its adoption has paused challenges to organizations, partly because of partial understanding of what it is and the logic behind it (Henry, 2009).

Though the BSC has received wide acceptance across the globe, different organizations have faced challenges in the implementation of the model. According to Atkinson (2006), it was estimated that 70% of BSC initiatives failed without any contribution in performance. Yet, issues related to challenges or barriers in BSC implementation remain under researched. This is attributed to different reasons such as difficulties for organizations in linking performance measures to business strategy (Lord, et al., 2005), placing of higher importance for the financial measures than the non-

financial measures (Blundell, et al., 2003) and failure in creating strategy awareness (Norreklit, 2002) (cited by Manyi, 2016). Therefore, it is important to study the application of balanced scorecard model with its prospects and the challenges as a performance management tool.

In our country Ethiopia, BSC has taken as the most important tool to be applied in almost all government institutions since its introduction in 2009 (Dawit, 2015). Accordingly, ethio telecom is one of the government companies that adopted the Balanced Scorecard model as a performance management tool.

Ethio telecom is an Ethiopian public enterprise which provides telecom services for the country. Telecommunications service was introduced in Ethiopia in 1894 during the era of Emperor Menelik II. It was commenced with the construction of the telephone line from the city of Harar to Addis Ababa. Then interurban network expansions were done across the country. Interconnections of important centers in the country were made by lines to facilitate long distance communications with the assistants of operators at intermediate stations. (www.ethiotelecom.et).

With the objective of transforming the telecommunication infrastructure and service to the world standard and support the steady growth of the country, ethio telecom was born in November 29, 2010 after it was named as Ethiopian Telecommunication Corporation since 1997 by proclamation of 10/1989E.C. Thus, ethio telecom was formed under the regulation which is issued by the council of ministers pursuant to article 5 of the definition of powers and duties of the executive organizations of the Federal Democratic Republic of Ethiopia proclamation No.6912010 and article 47(a) of the public Enterprises Proclamation No. 25/1992 of November 20, 2003 E.C. (Wubamlak, 2016).

Ethio telecom has commenced the implementation of the Balanced Scorecard on July 01, 2015 in order to improve its effectiveness and efficiency (Kidist, 2017). The model is implemented as a performance management tool in all its working divisions and Supply Chain Division is one of the company's working divisions which is in charge of availing resources to support the well performance of the telecom service provision of the company.

The Supply Chain Division of ethio telecom has three departments of Logistics Department, Sourcing Department and Supply Strategy and Relations Management Department. And, each department consists of different sections. The division uses the BSC model as a measure of the supply chain performance using the four perspectives of internal process, finance, customer, and learning and growth since 2015.

Hence, this thesis attempts to examine the application of the Balanced Scorecard as a measure of Supply Chain Performance in ethio telecom.

1.2. Statement of the Problem

Performance evaluation compares actual result with the planned in terms of both in resource utilization and production. It measures inputs, outputs and outcomes over time (Mathiyalagan, et.al, 2014). Performance measurement enables supply chain to strategically manage and continuously control achieving objectives. It provides the necessary assistance for performance improvement in pursuit of supply chain excellence (Najmi, Gholamian & Makui. 2013).

Recently, organizational performance measurement and metrics have attracted much interest from researchers and practitioners. The establishment of proper supply chain performance evaluation scheme is the basis of its effective operation and management. Most of the conventional supply chain performance evaluation is a stationary evaluation, while the actual supply chain is a dynamic system, therefore need to familiar with systems to conduct the evaluation (Yan and Yang, 2013).

According to Barbara and Eleonora (2010), development of integrated performance measurement systems which serve different functions in supply chain and operations management is an important issue for the supply chain management of organizations. As a measure of supply chain performance, organizations use different performance measurement tools. Balanced Scorecard and Supply Chain Operations Reference (SCOR) model are the two main perspective based models (Najmi, et al., 2013). Several organizations have employed the BSC model as tool for performance

evaluation through four perspectives of financial, internal business process, customer, and learning and growth.

Due to its implementation in many organizations, the BSC model has attracted researchers and several studies were conducted on the BSC model as a performance management approach. The work of Manyi Wang (2016) investigated the issues of BSC implementation in Chinese companies through literature review and found that senior management and employee involvement, communication, strategy reward system, performance measures, information system and the level of management are important considerations influencing the BSC implementation.

Ogwang (2017) examined the effect of Balanced Scorecard on supply chain performance in National Oil Corporation of Kenya and indicated that all the four perspectives of the BSC have positively affected the supply chain performance in the corporation.The research by Callado and Jack (2015) aimed at identifying whether particular metrics used in BSC are related to specific supply chain roles in 121 Brazilian Agri-Business Supply Chains and found that though several common performance indicators have been identified that apply to most of the supply chain roles, there is statistically significant evidence that shows that BSC profile are not the same for all the supply chains. This indicates the need for particular performance indicators relating to specific supply chain roles.

BSC is implemented in public sectors other than business organizations too. Rowland (2015) analyzed the challenges of Balanced Scorecard implementation in the health sector of Kenyatta National Hospital and the findings showed that the BSC implementation has challenges such as inflexible organizational arrangement, shortage of resources, unfavorable organization culture, lack of equipment, lack of effective communication and negative external influence and cascading.

The model is also deployed in different telecom companies. However, there is lack of published research within telecommunication companies (Mohammedhamed, et al., 2015). A case study was conducted to establish the application of Balanced Scorecard in performance management at Essar Telecom Kenya Ltd and the study revealed the need for the provision of enough resources and

vigorous capacity building for the successful implementation of the model (Stephen & Gabriel, 2012). Similar results were obtained in the Safaricom Kenya Limited which revealed that training, leadership, and communication enhance the proper implementation of the BSC (Thuo, 2012).

In the Ethiopian case, there are also studies on the implementation of the BSC in different organizations. The banking sector was the first to adopt the BSC model as a performance management tool in Ethiopia. Tsion (2014) examined the challenges and prospects of BSC in the Development Bank of Ethiopia and found that lack of top management commitment, lack of understanding of the tool and early cascading are the major challenges faced the implementation of the model though it helped to improve performance through communication of the bank's mission, vision and strategy to its employees. Similar study was conducted by Dawit (2015) and the result showed that strategic vision has been maintained due to the implementation of BSC in the Development Bank of Ethiopia though the employees' attitudinal change, customer satisfaction, operational efficiency, management commitment remained below the expectation.

BSC is also implemented in the pharmaceutical industry of Ethiopia. The study of Yenesew (2018) established the extent to which the BSC measures have been used at Cadila Pharmaceutical in measuring supply chain performance and found that the BSC measures are greatly used in the organization with customer measures followed by innovation, learning and growth, financial measures and internal business measures respectively have influential effect on the supply chain performance.

Ethio telecom has implemented the BSC in 2015 and few studies have been conducted to assess the challenges and practices of the BSC implementation in ethio telecom. Wubamlak (2016) assessed the practice and challenges of BSC on the procurement department and Kidist (2017) assessed the challenges of BSC in the customer service (call center) of ethio telecom. The result of Wubamlak (2016) revealed that the BSC implementation of the ethio telecom procurement department has faced challenges of lack of technical skill on BSC, lack of periodic monitoring of performance progress and lack of adherence to plan; while the result of Kidist (2017) showed that

the BSC implementation of the Customer Service (call center) challenged by lack of top management support, lack of learning and growth, unavailability of IT support and lack of employee participation.

However, the study of Kidist did not consider the supply chain performance and the work of Wubamlak was limited to the procurement department while the Supply Chain Division in the company contains Logistics, and Supply Strategy and Relations Management departments along with Procurement (Sourcing) department. In addition to that, both studies had not considered the prospects of the BSC in the company. Thus, it is important to study the application of the BSC as a measure of supply chain performance in ethio telecom; including the logistics, the supply strategy and relations management, and the procurement departments since all the three departments together perform the supply chain activities of the company. Hence, this paper attempts to examine the application of BSC as a measure of supply chain performance in ethio telecom to show its prospects and challenges in the wider sense of the supply chain division.

1.3. Research Question

The study is intended to address the following research questions in order to achieve the research objectives:

- ✓ What is the status of the alignment of the four BSC perspectives (i.e. finance, customer, internal process, and learning & growth) with the Supply Chain Performance in ethio telecom?
- ✓ What are the benefits of BSC as a measure of supply chain performance in ethio telecom?
- ✓ What are the prospects of using BSC for supply chain performance in ethio telecom?
- ✓ What are the challenges of BSC as a measure of supply chain performance in ethio telecom?

1.4. Objectives of the Study

1.4.1. General Objective

The general objective of the study is to examine the application of Balanced Scorecard as a measure of supply chain performance in ethio telecom.

1.4.2. Specific Objectives

The specific objectives of the study are:

- ✓ To assess the alignment of the four BSC perspectives (i.e. finance, customer, internal process and learning & growth) with the supply chain performance in ethio telecom
- ✓ To identify the benefits derived from the BSC as a measure of supply chain performance in ethio telecom
- ✓ To assess the prospects of using BSC for supply chain performance measurement in ethio telecom
- ✓ To identify the challenges of the BSC as a measure of supply chain performance in ethio telecom

1.5. Significance of the Study

The study provides an insight on the application of BSC in ethio telecom to show potential improvements in the application the BSC in the supply chain division of the company. It adds on the existing literatures on the application of BSC for the supply chain activities in the telecom sector for the academic society. It will also serve as a background for further studies on BSC as a measure of supply chain performance for researchers. Thus, the result provides useful insights on the application of BSC as a measure of supply chain performance.

1.6. Scope of the Study

The study is limited to examining the application of BSC as a measure of supply chain performance at ethio telecom supply chain division at corporate level only. Ethio telecom Zonal and regional offices outside the corporate level are not covered under this study due to resource constraints. And, most of the supply chain activities of the company are done at the corporate level.

1.7. Limitation of the Study

The study focused on the application of the BSC as a measure of supply chain performance in ethio telecom and it doesn't include other divisions of the company and it is also limited to the corporate level of the supply chain division.

1.8. Definition of Concepts and Terms

Balanced Scorecard: The Balanced Scorecard is a performance management tool that allows an organization to convert its vision and strategy into a real set of performance measures. However, it is more than a measurement mechanism. The scorecard gives a holistic view of an organization's overall performance by aligning financial measures with other key performance indicators of customer perspectives, internal business processes, and, learning and growth (Kaplan and Norton, 1996).

Challenge: it is a difficult situation that requires greater effort to accomplish a desired task successfully (https://dictionary.cambridge.org).

Performance Measurement: it is generally defined as the process of measuring the efficiency and effectiveness of action (Neely et al., 1995). Effectiveness is the degree to which customer's requirements are met, while efficiency measures how economically resources are utilized to meet the desired customer satisfaction (Nedaa & Mohammed, 2012).

Prospects: The possibility of achieving success or something good due to certain actions (https://dictionary.cambridge.org).

Supply Chain Performance Measurement: it is a performance measurement model which is based on common goals, measures, measurement methodology that specify procedures, responsibilities and accountability of supply chains, and the condition of the measurement scheme along with supply chains (Holmberg, 2000/cited by Kyung, 2014).

Financial Perspective: explains the tangible outcomes of the strategy in conventional financial terms such as return on investment, profitability, revenue growth, and lower costs (Kaplan and Norton, 2004)

Customer Perspective: describes the value proposition the organization desires to use to achieve sales and loyalty from customers. This value proposition forms the situation in which the intangible assets create value (Kaplan and Norton, 2004).

Internal Process Perspective: defines the key processes that generate and provide the distinguishing customer value propositions (Kaplan and Norton, 2004).

Learning and Growth Perspective: describes the intangible assets that are highly essential to the strategy. The objectives in this perspective identify which tasks (the human capital), which systems (the information capital), and what kind of climate (the organizational capital) are required to support the value-creating internal processes. These intangible assets must be integrated with the key internal processes (Kaplan and Norton, 2004).

1.9. Organization of the Study

The study is organized in to five chapters. Chapter one presents the introductory part of the study, which comprises the back ground of the study, statement of the problem, research questions and objectives, significance, scope and limitations of the study, and definition of terms. Chapter two deals with the review of related literatures to the study; and, Chapter three gives detail account of

the design and methodological aspects. The analysis of the study, presentation of the results and discussions are dealt under chapter four. Chapter five is the last by providing conclusions and relevant suggestions based on the findings of the study.

CHAPTER TWO
LITERATURE REVIEW

2.1.Theoretical Literature Review

2.1.1. The Balanced Scorecard

The traditional performance measurement tools solely rely on financial measures. However, financial reports show only the past and are not relevant to many levels of organizations for decision making. Stress on financial measurements only is contradictory with the new creation of value, which needs human capital, customer partnerships and a culture of innovation (Jorge and Mario, 2014). To mitigate the limitations of the traditional financial performance measures, Kaplan and Norton (1992) have proposed the Balanced Scorecard (BSC) model as a tool for performance measurement.

The BSC is a mechanism to integrate business operations to organizations' vision and strategy, enhancing internal and external communications, and evaluating business performance in terms of strategic goals. It includes four performance indicators (perspectives) of customer, internal-business processes, learning and innovation and financial perspectives (Kaplan & Norton, 1996). The BSC initially developed by Kaplan and Norton (1992), motivated by the growing dissatisfaction with traditional financial measures as a key measure for company's performance (Barbara and Eleonora, 2010).

In fact, the BSC model was not the first to advocate the use of the non-financial measures to motivate measure and evaluate company performance. According to Kaplan (2010), the General Electric corporate staff group developed performance measures containing one financial and seven non-financial metrics in the 1950s. The financial metric measures the profitability using residual income while the seven non-financial metrics measure the market share, productivity, product leadership, public responsibility, personnel development, employee attitudes, and balance between

short range and long range objectives. Thus, the four perspectives of the Balanced Scorecard have been incorporated in the eight General Electric performance metrics. The financial perspective is represented in the profitability metric, the customer perspective with market share, the internal process perspective with productivity, product leadership and public responsibility while the learning and growth perspective is represented by personnel development and employee attitudes. Furthermore, the last metric of balance between short range and long range objectives captures the essence of the Balanced Scorecard itself (Kaplan, 2010).

Therefore, the Balanced Scorecard involves both the financial and the non-financial performance measures through a "balanced" approach. According to Jorge and Mario (2014), the BSC acknowledges the increased importance of intangible assets in value generation and the restrictions of financial measurements. This alternative approach "balanced" financial and operational measures and allows the organization to control corporate performance in a multi-dimensional concept, simultaneously.

According to Kaplan and Norton (1996), BSC is an effective performance measurement tool due to the below reasons:

- ✓ It provides complete structure that transforms strategic objectives into a coherent set of performance measures,
- ✓ It initiates dynamic developments in key areas as product, process, customer and market development,
- ✓ It harmonizes conventional financial measures of performance for customers, internal processes, and innovation and growth patterns,
- ✓ It grounded on an organization's strategic objectives and competitive demands so that limited number of critical indicators can be selected within each of the four perspectives,
- ✓ It works as the cornerstone of a company's current and future success,
- ✓ The indicators of the four perspectives give balance between external and internal measures. However, the Balanced Scorecard may not be suitable to all businesses in

general. Diverse market conditions, product approaches, and competitive scenarios require customized scorecards. Organizations create customized scorecards in line with their mission, strategy, technology and culture (Kaplan and Norton, 1996).

The Balanced Scorecard converts an organization's mission and strategy into a general set of performance measures that provides the framework for a strategic measurement and management scheme using a balanced set of measures for financial and non-financial performance, connected by cause-and-effect and grouped into four perspectives as shown in the below diagram (Jorge and Mario, 2014):

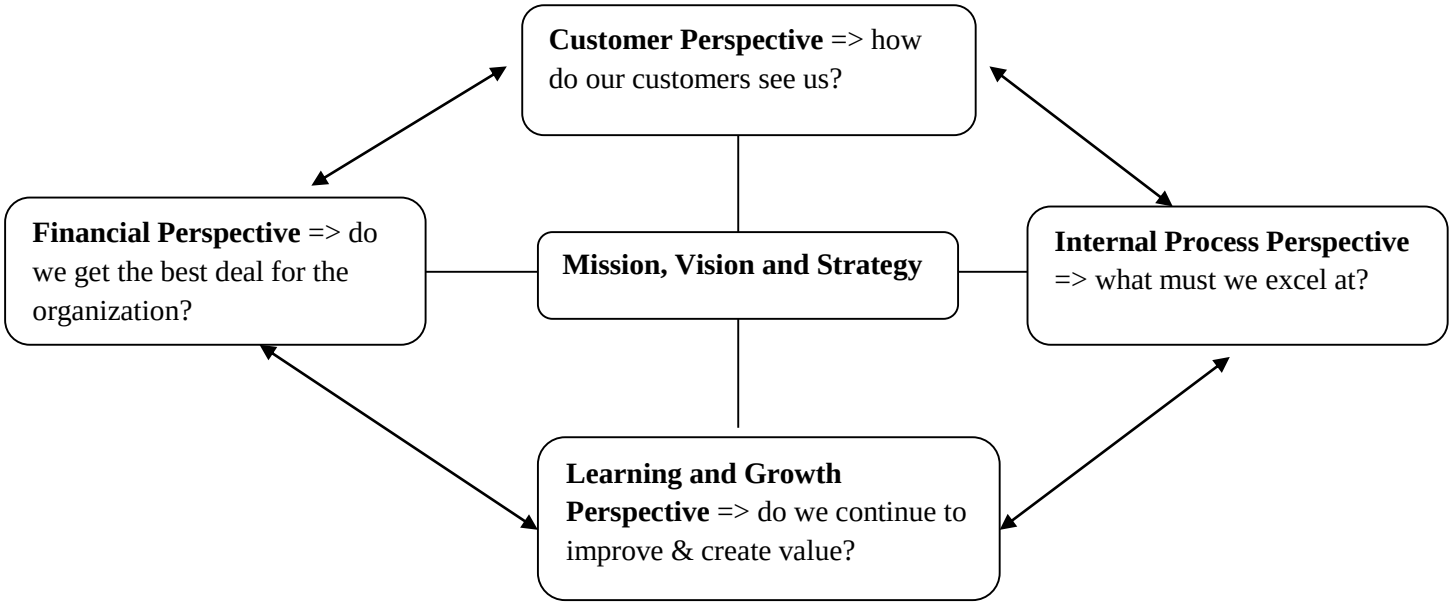


Diagram 1 – Strategic Perspectives (adapted from Kaplan & Norton, 1996), adapted by Jorge and Mario (2014)

However, different obstacles were reported in certain researches on the Balanced Scorecard model. To overcome the difficult situations, Kaplan and Norton (2001) suggested considering the below points:

- ✓ Few or too many measures. To achieve appropriate balance between leading and lagging indicators, a suitable combination of outcomes and performance drives need to be set.

- ✓ Measures that are not linked with strategy. More attention needs to be given for measures that are aligned with the organizations strategy instead of applying all the performance indicators into each perspective.

- ✓ Lack of top management commitment and employees involvement. The top management team should work together to build and support the implementation.

- ✓ Keeping the scorecard has top priority. All employees at different levels need to be participated in the implementation. The major factor is participation of all the organization on the course of the implementation.

- ✓ The implementation process takes too long. If the implementation takes long time and the strategy changed in the meantime, the KPIs become no more valid. Keep the development short implementation.

Performance management of supply chains become an important task, especially due to complex nature of business processes with multiple decision criteria. This is due to that organizations are looking for ways to improve their operational performance through better integration of operations across the value chain (Thales, Carlos, Kleber & Fabio, 2014). According to Cooper, Lambert & Pagh (1997), Supply chain management (SCM) explains the discipline of efficient delivery of goods, services and related information from origin to final destination. It deals with the effectiveness of meeting final customer's demand by the actors involved in the delivery of the product. A supply chain consists of supplier, manufacturer, distributor, and customer; and it is a network of companies that influence each other and affect one another's performance. Hence, an important issue in the supply chain management is the development of integrated performance measurement systems. The BSC is suitable for measuring and evaluating supply chain performance (Barbara and Eleonora, 2010).

As cited in the work of Thales (2014), the BSC has gained increasing acceptance as an instrument for the implementation of business strategies, and transforms them into related performance

measures, which can be extended to the performance assessment of supply chains (Zimmermann and Seuring, 2009). This is attributed to the following reasons indicated by Brewer and Speh (2001) and Bhattacharya et al. (2014):

- ✓ The goals of Supply Chain Management such as reduction of service time, response flexibility, reduced unit cost, launching new products… can be measured through internal process perspective.
- ✓ The results of Supply Chain Management - both as they related to customers (quality, time, flexibility and value), as those achieved financial aspects such as profitability, cash flow, return on investment and revenue growth can be measured through financial and customers perspectives.
- ✓ The rate of improvement in Supply Chain Management (innovation of products and processes, company management, information flow, identification of threats and substitutes) can be measured by learning and growth perspectives.

2.1.2. Supply Chain Performance Measurement

Performance measurement deals with evaluation of activities with respect to achieving strategic objectives. Thus, performance measurement helps to attain efficiency and improve quality (Bhagwat and Sharma, 2007). According to Neely, Gregory & Platts (1995), performance measurement is the process of quantifying the efficiency and effectiveness of actions.

According to the Supply Chain Council (2005), the supply chain covers all activities in producing and delivering a final product, from the initial supplier to end customer. It involves five basic processes of plan, source, make, deliver and return. Therefore, measuring the performance of the supply chain containing its basic processes is crucial to quantify the efficiency and effectiveness of those actions.

According to Ezutah and Kuan (2009), many attempts have been made on supply chain performance measurement using conventional approaches such as the supply chain Operations

Reference (SCOR) model, performance vector, and Data Envelopment Analysis (DEA) model among others.

The supply chain operations reference (SCOR) model was proposed by the supply chain council in 1996 as a framework which integrates the basic concepts of business process re-engineering, bench marking and process measurement into a cross functional framework (Ezutah and Kuan, 2009). It measures the supply chain performance through its major functions of plan, source, make, deliver and return.

Sabri and Beamon (2000) used a performance vector to integrate strategic and operational analysis of supply chain in order to describe the efficiency and effectiveness within the supply Chain (Ezutah and Kuan, 2009). The Data Envelopment Analysis (DEA) was developed by Wong and Wong (2007) to measure the supply chain performance for the internal supply chain efficiency (Ezutah and Kuan).

Ferdoush, Mamun & Zurina (2018) outlined a number of supply chain performance measurement systems such as Activity Based Costing (ABC), Balanced Scorecard, Supply Chain Operations Reference (SCOR) model, Dimension Based Measurement Systems, Interface Based Measurement Systems, Perspective Based Measurement Systems, Hierarchical Based Measurement Systems, Function Based Measurement Systems, Performance Prism, and Hybrid of Balanced Scorecard Model and Supply Chain Operations Reference approaches. The brief descriptions of the mentioned supply chain performance measurement systems are presented as follows:

1. **Activity Based Costing (ABC):** it was established in 1987 and it emphasizes on financial measures to operational performance which contains breaking down activities in to distinct jobs or cost drivers while appraising the resources. The method allows improved evaluation of the accurate productivity and costs of a supply chain process.
2. **Balanced Scorecard (BSC):** it is an authoritative performance management tool developed in 1992. It allows detecting a composed understanding on operational and

financial measures at a glimpse. It employs four perspectives of financial, customer, internal business process, and learning and innovation. It is dominant in delivering managers with a comprehensive image of the business performance.

3. **Supply Chain Operations Reference (SCOR) Model:** it was formed by the Supply Chain Council with its initial version established in 1996. The model states supply chain as five main assimilated processes of Plan, Source, Make, Deliver and Return. Thus, performance procedure is measured from five perspectives of Reliability, Responsiveness, Flexibility, Cost and Asset. It is described as a comprehensive method as it stretches the chain from supplier's supplier to customer's customer.
4. **Dimension-Based Measurement Systems:** it employed three methods in the supply chain performance measurement systems. The methods are Flexibility, Resources and Output. Resource performance measures include: inventory cost, manufacturing cost and return on investment (ROI) while the output performance measures include: fill rate, total sales and on-time deliveries. The flexibility parameters measure volume changes and new product introduction.
5. **Interface-Based Measurement Systems:** it is a framework where each stage is connected within a supply chain. It was established in 2001 and the method produces a means for associating performance from point of origin to point of consumption with the objective of improving the stakeholder value for the overall supply chain as well as business enterprise.
6. **Perspective-Based Measurement Systems:** it was conceptualized in 2003 and it perceives supply chain with all the possible insights and delivers measures to apprise each of them. It employs six core viewpoints of Operations Research, System Dynamics, Marketing, Logistics, Organization and Strategy. The method provides exclusive metrics for each viewpoint to assess performance of supply chains. To measure the logistics performance, the Perspective-Based Measurement System recommends to use the logistics aspects of the supply chain which involves the logistics financial measures such as return on assets and expenses, the logistics productivity measures such as orders shipped per hour, the logistics

quality measures such as shipment damage, and the logistics cycle time measures such as order entry time.

7. **Hierarchical-Based Measurement Systems:** it classified enterprise goals as strategic, tactical and operational. The main principle deals with appropriate management level to facilitate fast and appropriate decisions. The metrics incorporate financial and non financial matters that link together with the hierarchical interpretation of supply chain performance measurement.
8. **Function-Based Measurement Systems:** it was developed in 2005 to cover the comprehensive performance measures. It is pertinent at the different linkages of the supply chain. Though it is simple to implement and targets can be dedicated to individual departments, it doesn't provide top level measures to cover the entire supply chain. Function-based measurement systems are generally criticized for viewing the separate supply chain functions in isolation with the overall strategy.
9. **Performance Prism:** it advocates that performance should be assessed throughout five diverse scopes of strategies, processes, capabilities, stakeholder satisfaction and stakeholder contributions. The core focus of this theoretical structure is that it cross examines the business strategy before the progression of choosing methods which eventually warrants the root foundation of the performance measures with the organization.
10. **Hybrid of SCOR and BSC Models:** this measurement approach combines SCOR measurement and adapts Balanced Scorecards. Material and product flows run by SCOR metrics and the BSC was deployed for the representation of business objectives and for the requirements of a top-down controlling approach to keep the supply chain on course towards realizing business strategy and achieving improvement, to supply network scorecards. The main objective of suggesting an integrated approach of SCOR and BSC was to ensure a greater effectiveness of performance management system by adopting complete traceability on the type of process such as planning, execution and enabling through SCOR and integrating top level strategic scorecard and operational measures through BSC.

2.1.3. Balanced Score Card and Supply Chain Management

The Balanced Scorecard for the Supply Chain Management framework is structurally similar with the Balanced Scorecard framework at the corporate management level. Supply chain metrics for the measure of supply chain performance can be applied for the four perspectives of finance, customer, internal process, and learning & growth of the Balanced Scorecard (Bhagwat and Sharma, 2007). The link between Supply Chain Management (SCM) and the Balanced Scorecard was also indicated by Brewer and Speh (2000). Accordingly, the SCM goals of waste reduction, time compression, flexible response and unit cost reduction are linked to the internal business process perspective; the SCM aims of improved product/service quality, improved timeliness, improved flexibility and improved value are connected to the customer perspective; the SCM objectives of higher profit margins, improved cash flows, revenue growth and higher return on asset have linked to the financial perspective of the BSC. Moreover, the SCM improvement requirements of product/process innovation, partnership management, information flow, threats/substitutes are associated with the innovation and learning perspective. The supply chain performance metrics for each BSC perspective is presented in the below sub-topics.

A. Financial Perspective and Supply Chain Management

Financial performance measures indicate whether the company's strategy, implementation and execution are effectively contributing to the bottom line improvement of a firm. Financial goals include achieving profitability, maintaining liquidity and solvency both short term as well as long term, growth in sales turnover and maximizing wealth of shareholders. In simplicity, financial goals are to survive, succeed and prosper. Survival is measured by cash flow, success by growth in sales and operating income and prosperity by increased market share and return on equity and capital employed (Bhagwat and Sharma, 2007). Financial performance indicators include market share, sales growth, net profit margin, reduction in manufacturing cost, reduction in distribution cost, and reduction in inventory and warehouse cost (Mathiyalagan, et.al, 2014). Furthermore,

return on investment, cost per operation hour, information carrying cost can be considered as performance metrics for financial perspective (Bhagwat and Sharma, 2007).

According to Brewer and Speh (2000), when the goals of supply chain partners are being achieved and the benefits are flowing through to customers, supply chain members should experience financial success. The most commonly reported benefits for firms that adopt supply chain management are lower costs which lead to higher profit margins, enhanced cash flow, revenue growth, and a higher rate of return on assets. Because activities are harmonized and unduplicated, the cost of transportation, order processing, order selection, warehousing, and inventory is usually reduced. A study to validate the correlation between supply chain integration and business success shows that best practice supply chain management companies have a 45% total supply chain cost advantage over their median supply chain competitors.

B. Customer Perspective and Supply Chain Management

The BSC demands that the management must translate their general mission statement on customer service into specific measures that reflect the factors that really matter to the customers. Customers generally, concern to lead-time, quality of products and services, company's performance service and the cost effectiveness. But on long term basis and more importantly in the era of globalization any firm's competitiveness lies on different customer related factors such as range of products and services, order lead time, flexibility of service systems to meet particular customer needs, delivery lead time, delivery performance, delivery reliability and defect free deliveries among others (Bhagwat and Sharma, 2007). According to Mathiyalagan, et.al, (2014), customer satisfaction information is key knowledge and a critical success factor. Poor performance of the customer perspective is a leading indicator of future decline, even though the current financial picture may look good. The customer perspective also includes factors like lead time, number of defects per order, on time delivery rate and accuracy of delivery forecast.

Thus, in the customer perspective, performance measures are aimed at creating tangible results for customers. As cited by Ashioya (2013) and Yenesew (2018), one of the changes in business

practices dictated by the transition from the industrial age to the information age is the shift of enterprises from being production- and product-focused to being customer-focused (Arik, 2006).

From the view pint of supply chain management, when the supply chain reduces waste, improves cycle time and flexible response, and minimizes costs, these benefits should flow through to customers. Thus, a key focus of a supply chain and its members is on monitoring the extent to which the customer is realizing these important benefits and on assessing the factors that may impede their realization (Brewer and Speh, 2000). According to Yan and Yang (2013), Supply Chain Balanced Scorecard is more concerned about the performance of the supply chain in the level of customers and market segments, and clarify how to meet customer needs in order to effectively achieve the financial goals of the entire dynamic alliance.

The customer perspective asks what customers must believe about the company in order for it to be successful. The measures chosen should capture customer opinion. They can be general such as those focusing on customer value, and customer retention or they can more specifically address a dimension of customer value such as product and service quality, response time, flexibility, or cost (Brewer and Speh, 2000). Therefore, the customer perspective is core from both viewpoints of strategic mission and supply chain management.

C. Internal Perspective and Supply Chain Management

A process of innovation guided by the needs of customers encapsulates four major processes; identification of the opportunities for new products and services, managing the research and development(R&D) portfolio, designing and developing new production and service, bringing novel products and services to the market. Hence, the internal process can be referred to as a supply chain which develops services to customers (Fahmi and Saudah, 2015).

According to Bhagwat and Sharma (2007), the internal measures for the BSC stems from the business process that have the greatest impact on customer's satisfaction factors that affect cycle time, quality, skill of the employees, and of course, productivity. Firms should decide what processes and competencies they must excel at and specify measures for each of them. The

performance metrics for the internal business process include capacity utilization, product development cycle time, purchase order cycle time, planned process cycle time, and effectiveness of master production schedule among others.

The internal business process perspective helps to know how well the business is doing and whether its products and services conform to customer requirements. The factors for the internal process can be productivity, customer order cycle time, manufacturing cycle time, inventory replenishment cycle time, cash to cash cycle time and number of defects per order (Mathiyalagan, et.al, 2014). It is about what must be done internally to meet and exceed the customers' needs (Brewer & Speh, 2000). According to Yan & Yang (2013), the internal business process measures those internal processes that have greatest impact on customer satisfaction and achieve organizational financial goals. Balanced Scorecard method introduced innovative processes to internal business processes, from the point of view of the supply chain considerations, it require companies to create new products and services to meet the current and future target customers demand. These processes can create value in the future to promote the future of corporate financial performance.

Therefore, the internal business process perspective of the BSC mainly emphasizes that organizations must control important working conditions or inner process that may create value to customers and shareholders. For an organization to be effective in performance, the internal working process and systems should be as excellent as possible in assisting operational units to provide values to attract and retain clients of the market (Yenesew, 2018). Hence, since the internal business process is critical to achieve the core objectives of the financial and customer perspectives, improvement on the internal process provides enhancement on the supply chain management as well as in achieving the overall company's strategy.

D. Innovation and Learning Perspective and Supply Chain Management

The innovation and learning perspective is also referred as the learning and growth perspective. The innovation and learning objectives are intended to drive improvement in financial, customer

and internal process performance (Kaplan and Norton, 1996). In this perspective, the rate of improvement in supply chain management can be measured through innovation of products and processes, information flow, and identification of threats and substitutes (Thales, et.al, 2014).

According to Jorge and Mario (2014), learning and growth of employees is the foundation for innovation and creativity. It prescribes for the achievement of vision and ability to change (Kaplan and Norton, 2014). It guides the organization on where to focus its training fund. The concentration is on employee training to improve performance. Also this perspective ensures creation and maintenance of corporate culture attitudes that would result in the achievement of the vision (Rowland, 2015).

Organizational learning and growth come from three principal sources of people, system and organizational procedure. This implies the need to invest in re-skilling employees, enhancing information technology and systems, and aligning organizational procedures and routines (Kaplan and Norton, 1996).

Thus, in order to attain the high performance required capacities, companies should invest on trainings to enable employees to acquire new skills, and straighten out the program and the day to day work of the organization (Yan and Yang, 2013). According to Mathiyalagan (2014), the learning and growth perspective include employees training and corporate cultural attitudes related to both individual and corporate self-improvements. Manyi (2016) also stated that the learning and growth perspective focuses on internal skill and capabilities of the employees, and corporate cultural attitudes. The introduction of the BSC model has changed the fact that organizations only focus on financial indicators for performance evaluation.

From the view point of the supply chain management, the most important indicators belonging to the learning and growth perspective are related to the collaboration with supply chain players. That is, supplier assistance in solving technical problems, supplier ability to respond to quality problems and buyer-supplier collaboration in problem solving. However, order entry methods and level of information sharing are considered as the less important indicators (Barbara and Eleonora, 2010).

According to Brewer and Speh (2000), the innovation and learning perspective asks what needs to be done on a continuing basis to delight and retain customers. The focus is on the future as opposed to current capabilities. Measures tend to relate to such issues as new product development cycle time, percentage of sales from new products, and process improvement rates. Also, this is the segment of the scorecard in which firms tend to incorporate human resource management measures, thereby recognizing that people are the true drivers of innovation and learning.

Innovation and continuous learning process can bring efficiency in operating domain of the business. Moreover, it ensures cost reduction and product differentiation to meet the varied requirements of the customers. As a result, it strengthens the financial ability through earning higher profitability and greater degree of appropriation of profit and retaining larger share of earnings to finance the forth coming expansion of future projects of the company under consideration. Performance metrics for the innovation and learning include supplier cost saving initiatives, level of customer perceived value of product, range of products and service and accuracy of forecasting techniques among others (Bhagwat and Sharma, 2007).

Therefore, the human capital of the organization is the major factor to meet the objectives of the financial, customer and internal process perspectives through the innovation and continuous learning parameter. This indicates that companies need to invest on the development of their human capital in order to sustain long term performance.

2.1.4. Prospects of Balanced Score Card in Measuring Supply Chain Performance

The Balanced Scorecard model can be adapted for measuring supply chain performance. Its four perspectives of finance, customer, internal process, and learning and growth can be aligned to the supply chain management goals. Reduction of service time, response flexibility, reduced unit cost and launching of new products in the supply chain management can be measured through the internal process perspective of the BSC. The results of supply chain management like quality, time,

flexibility and value that are related to customers and the financial aspects such as profit margin, cash flow, income growth and return on assets can be measured through the customer and financial perspectives. Moreover, the learning and growth perspective of the BSC can be used to measure the rate of improvement in the supply chain management through innovation of products and processes, information flow and identification of threats and substitutes (Brewer and Speh, 2000). The implementation of BSC in measuring supply chain performance involves several prospects.

According to Thales, et.al, (2014), different literatures identified the benefits of using the BSC for the measure of supply chain performance. The alignment of conceptual BSC frameworks of the supply chain management objectives ensures integration of different company operations, discussion of company relationships with its external business environment, consistent monitoring approaches for all organizational partners, companies' connection with the general organizational strategies, employees engagement with operational objectives in measuring performance, check of only a few measures or performance indicators at any one time, bridge between financial and non-financial fields, and improved management of information on organizations. Moreover, using the BSC allows for stakeholders to determine the health of short, medium and long term objectives at a glance.

The advantages of the BSC as a performance measurement tool in general can be translated to the supply chain management framework in particular. Because the specific supply chain objectives can be linked to the four perspectives of the balanced scorecard. Thus, the benefits of the BSC as a measure of overall organizational performance can be attained for the supply chain performance as well. The following strengths of the BSC are outlined by Jorge and Mario (2014) from different literatures:

- ✓ Ability to link organizational strategies with operational activities
- ✓ Ability to translate strategy in to operational terms
- ✓ Ability to spread strategy over the four perspectives in order to attain balance between the financial and the non-financial measures

- ✓ Ability to attain balance between the internal and external aspects of the business through its perspectives of internal process and customers.
- ✓ It allows employees to understand the strategy and objectives of the company
- ✓ It can be applied in companies of any size to manage and evaluate business strategy, monitor operational efficiency and communicate related processes to all employees

According to Kaplan and Norton (1996), the implementation of BSC in an organization can have a number of benefits such as gaining consensus on strategy, aligning departmental and personal goals to strategy, linking strategic objectives to long term targets and annual budgets, identifying and aligning strategic initiatives, and obtaining feedback to learn about and improving strategy. BSC can also enhance organizational performance in a number of ways. It enables the actors have a shared vision and common direction of their organizational strategies, and better understand and react to customers needs through improved organizational performance by focusing on what matters (Dawit, 2015).

A key advantage of the Balanced Scorecard is that it puts strategy, structure, and vision at the center of management's focus. It emphasizes an integrated combination of financial and non-financial performance measures. It keeps management focused on the entire business process and helps ensure that actual current operating performance is in line with long term strategy and customer values. Furthermore, the cause and effect linkages of the BSC confine the difficulty and interrelationships of a strategy, facilitating explicit tradeoffs among quality, cost and access (Mohammed, 2014).

However, to reap the fruits of the BSC, proper implementation and adequate follow-ups are necessary. And there are also challenges in the BSC implementation which need to be considered to make the implementation successful. Some of the challenges of BSC identified by different authors are discussed in the next topic.

2.1.5. Challenges of Balanced Score Card in Measuring Supply Chain Performance

Though the BSC has received wide acceptance across the globe, different organizations have faced challenges in the implementation of the model. According to Atkinson (2006), it was estimated that 70% of BSC initiatives failed without any contribution in performance. Failures may be due to a lack of highly developed information systems, inadequate top-management support or excessive management focus on short term issues (Ashioya, 2013).

In relation to the supply chain management, failure to include all stakeholders become the most challenging task in the application of the BSC since the supply chain involves many actors from the supplier's supplier to customer's customer. Several challenges of BSC to measure organizational performance as well as supply chain performance are depicted in the work of Jorge and Mario (2014) obtained from different related literatures. Some of the challenges are listed as follows:

- ✓ Failure to include all stakeholders in the BSC. Particularly, suppliers and public authorities which can be decisive for many organizations
- ✓ The invalid assumptions of causal relationships between performance indicators
- ✓ Lack of mechanism to maintain the relevance of the initially defined measures
- ✓ Lack of focus on the human resources dimension organization
- ✓ The BSC does not monitor competition or technological developments. It doesn't consider the uncertainty of inherent risks involved in the events that can threaten the strategy
- ✓ Absence of consensus on what the BSC is all about

According to Kaplan and Norton (2004), the challenges facing the use of the BSC can originate from either design or process failures. Process failure occurs when companies build poor balanced scorecards like the use of too few measures and fail to achieve a balance between the outcomes they are trying to achieve and the performance drivers of the outcomes. Others may include too many measures and ignore the vital few. Poor organizational processes such as organizational

structure, lack of management support, lack of participation, lack of communication and cascading of the BSC are also among the challenges (Rowland, 2015).

Some common errors that challenged the implementation of the BSC are discussed in the work of Bhagwat and Sharma (2007). Three of these errors are:

- ✓ Failure to include specific long term objectives,
- ✓ Failure to relate key measures to performance drivers by means of cause and effect relationships,
- ✓ Failure to communicate the contents and rationale for the balanced supply chain management scorecard.

There are also other challenging issues in the implementation of the BSC model. Manyi (2016) discussed the most commonly addressed issues in different literatures related to the Balanced Scorecard. According to Manyi (2016) the issues of BSC application indicated in literatures are strategy, senior management involvement, employee involvement, performance measures, communication and feedback, reward system, organizational factors, the integration with other control tools and information system.

For the strategy formulation, the impact of organizational environment on the BSC implementation, the integration of BSC with other control systems and the importance of information system, different authors suggested to consider the performance measures, BSC cascading, target and reward systems, the involvement of top managers and operational managers, as well as face to face dialogue in the course of BSC development. Smooth communication, clear indicators, and deep control and feedback systems are also suggested for the effective implementation of the BSC (Manyi, 2016).

In relation to performance measures, previous studies indicated that companies still pay much attention on financial measures and lack attention to the other BSC perspectives so that the four perspectives of the BSC couldn’t be balanced (Manyi, 2016).

Failure to link the BSC performance with reward systems is another issue identified by literatures. Linking BSC performance to the reward system is an essential measure to motivate employees and ensure strategic goals (Manyi, 2016).

Senior management involvement is also crucial for the successful implementation of the BSC. The introduction of BSC is challenging for leadership since the development and implementation of the BSC is a top-down process which cannot be realized without the support and involvement of top management. The top management needs to design strategy and BSC framework. Thus, if the BSC cannot get full support from the top management, successful implementation of the BSC will be difficult (Manyi, 2016).

With respect to communication and feedback, communication is important in the whole process of the BSC development and implementation. Lack of communication with employees will result in low strategy awareness. Therefore, managers should often communicate to employees for the feedback on BSC in order to revise the system on time. Furthermore, the level of employee involvement affects the outcome of the BSC implementation (Manyi, 2016).

Therefore, there is a need to examine the challenges of the BSC implementation to attain successful supply chain performance measures using the model.

2.2. Empirical Literature Review

2.2.1. Balanced Scorecard as a Performance Measurement Tool

Balanced Scorecard has become a widely applicable performance measurement tool. According to Emad and Amir (2015), the BSC is one of the most widespread performance measurement tools. A majority of the Fortune 1,000 companies was implementing the BSC within a decade since its emergence.

Due to its widespread implementation, several researchers have studied the application of the BSC in different organizations. The practice, the prospects and challenges of the BSC in different organizations are studied by different authors. Some of the empirical studies along with their results are discussed in this topic.

Bose and Thomas (2007) studied the application of the BSC in Foster's Brewing Group in Melbourne Victoria, where the application of BSC reversed the declining performance by improving the market value of the company. The company adopted the BSC as strategic management tool to acquire and improve intellectual capital, and to retain old markets along with attracting new markets. The study also identified several challenges faced in the company while implementing the BSC; such as taking long time for the implementation process due to the top-down structure of the implementation, the changing nature of the business environment required several re-conceptualizations of the BSC and multiple revision of key indicators due to new competitors and changing customer preferences, and the application required high costs of maintenance and dedicated leadership.

The study of Bhagwat and Sharma (2007), analyzed the implementation of BSC for the Supply Chain Management in three Small and Medium Enterprises (SMEs) in India. The case companies were involved in the manufacturing of welding consumables, brakes and clutches, and iron handicraft. The study sought to address the application of BSC and the difficulties faced at the case companies. Accordingly, the study revealed that all the three companies applied the BSC at business unit for performance measurement and used the four perspectives of the BSC with their number of measures varied from 4 to a maximum of 15. However, BSCs were collected manually through the use of spread sheets in the case companies with reporting frequency of once in a quarter year. The authors also identified some common errors in the implementation of the BSC like failure to include specific long term objectives, failures to relate key measures to performance drivers by means of cause and effect relationships, and failure to communicate the contents and rationale for the balanced supply chain management scorecard. Therefore, the study suggested automation of data collection, electronic processing of information, improvement in reporting techniques,

inclusion of stretch goals that require significant improvements in key areas to enhance the effectiveness of a BSC for the supply chain management.

A study on alignment of strategic business unit objectives using the BSC framework in the Malaysian Corporation case was done by Hazeline, Normah, Ibrahim & Faridah (2010) and the study underlined the need for aligning corporate strategy and strategic business unit strategies. However, the successful process of creating strategy alignment is affected by the level of middle management commitment, management change, learning culture, effective strategy communication, and skill and knowledge of managers.

During the last two decades, the use of the BSC has been widely spread in all sectors such as manufacturing and services; small and large firms; public and private sector (Mohammed, 2014). Essar Telecom is one of the service sectors that implemented the BSC. Stephen and Gabriel (2012) assessed the application of BSC in performance measurement at Essar Telecom Kenya Limited using data collected through personal interviews with the heads of departments of technical, information technology, customer experience, finance, human resource, and sales and marketing. The study revealed that Essar Telecom uses the BSC primarily for strategy implementation and performance management tool with the financial, customer, innovation and change performance measures being greatly used by the company despite the various challenges experienced such as concentration of the management on short term goals, inadequate top management support, lack of well-developed information system to support the BSC, organizational politics, change management strategy, lack of linkage between the BSC and employee reward, and lack of skills and know-how in developing and implementing the BSC among others. However, the study indicated that the benefits of BSC outweigh the costs if implemented fully, effectively and efficiently. Therefore, the study suggested allocation of enough resources and capacity building programs to improve the appreciation and usage of the BSC.

The work of Manyi (2016) investigated the issues of BSC implementation in Chinese companies through literature review and the findings show performance measures, reward system, top

management involvement, communication and feedback, and employee involvement are the five most widely discussed issues in literatures that are related to BSC implementation. The study suggested taking the strategy as the orientation, paying attention to top management, balancing performance indicators, linking BSC to incentive systems, improving enterprise information system, and strengthening corporate culture construction.

2.2.2. Balanced Scorecard as a Measure of Supply Chain Performance

Scholarly studies were also conducted that relate Balanced Scorecard model with supply chain performance measures. Ashioya (2013) conducted a study on the BSC and Supply Chain Performance in the case of Kenya Nut Company. The study was aimed at establishing the extent to which the BSC measures have been used and the challenges faced in implementing it in the case company using primary data collected through questionnaire. The findings of the study showed that BSC measures are greatly used to establish the supply chain performance in the Kenya Nut Company with percentage of sales margin, profit margin, range of products offered, accuracy of demand forecast, and level of partnership with suppliers being the extensively used measures. The challenges of BSC implementation identified by the study include taking too much time to develop and update the BSC, using of too many measures and difficulty in determining the measures. However, the study revealed significant relationship between the BSC measures and the supply chain performance of the company. Further, the study suggested adding measures such as return on supply chain assets, cost per operation hour, order lead time and product life cycle in order to improve the performance of the company by overcoming its challenges of slow production growth, lack of customer awareness, poor information systems, and high processing costs.

Another study conducted to identify whether particular metrics used in BSCs are related to specific supply chain roles in 121 Brazilian agri-business companies through the use of descriptive statistics by Callado and Jack (2015). The result showed that the BSC profiles are not the same for all supply chain roles despite several common performance indicators have been identified that

apply to most of the supply chain. The result indicated that any implementation of a supply chain performance measurement system should consider the use of performance indicators that are common to the role-type and specific to the constituent companies. Furthermore, the set of metrics and their distribution across the four perspectives of a BSC are different for each supply chain role. This implied the difficulty to achieve a Balanced Scorecard framework that is common and practical for all supply chain participants. Thus, there is a need to investigate other customized alternatives that address unique features of the supply chain roles.

In the case of National Oil Corporation of Kenya, Ogwang (2017) analyzed the extent to which the Balanced Scorecard perspectives are used to measure the supply chain performance of the corporation through mixed approach of using quantitative and qualitative data obtained through questionnaire and interviews. The result showed that the effects of customer perspective on supply chain performance were highly influenced by the customer relationship management implying that customers should be involved in decisions that affect them. Internal processes led to increase in the supply chain performance.

2.2.3. The Application of Balanced Scorecard in Ethiopia

In Ethiopia, BSC is implemented in many organizations as a government initiative. According to Adebabay (2011), the Balanced Scorecard is under implementation in different organizations throughout the country. It was determined by the government to be implemented in all federal organizations. Thus, the BSC is implemented in Ethiopia since 2009 (cited by Dawit, 2015).

Based on its implementation in different organizations in Ethiopia, some studies were conducted on the application of the Balanced Scorecard in the country. According to Dawit (2015), the banking sector was the first to adopt the BSC model as a performance management tool in Ethiopia.

Tsion (2014) examined the challenges and prospects of BSC in the Development Bank of Ethiopia and found that lack of top management commitment, lack of understanding of the tool and early

cascading are the major challenges faced the implementation of the model though it helped to improve performance through communication of the bank's mission, vision and strategy to its employees. Similar study was conducted by Dawit (2015) and the result showed that strategic vision has been maintained due to the implementation of BSC in the Development Bank of Ethiopia though the employees' attitudinal change, customer satisfaction, operational efficiency and management commitment remained below the expectation.

BSC is also implemented in the pharmaceutical industry of Ethiopia. The study of Yenesew (2018) established the extent to which the BSC measures have been used at Cadila Pharmaceutical in measuring supply chain performance and found that the BSC measures are greatly used in the organization with customer measures followed by innovation, learning and growth, financial measures and internal business measures respectively have influential effect on the supply chain performance.

Ethio telecom has implemented the BSC in 2015 and few studies have been conducted to assess the challenges and practices of the BSC implementation in ethio telecom. Wubamlak (2016) assessed the practice and challenges of BSC on the procurement department and Kidist (2017) assessed the challenges of BSC in the customer service (call center) of ethio telecom. The result of Wubamlak (2016) revealed that the BSC implementation of the ethio telecom procurement department has faced challenges of lack of technical skill on BSC, lack of periodic monitoring of performance progress and lack of adherence to plan; while the result of Kidist (2017) showed that the BSC implementation of the Customer Service (call center) challenged by lack of top management support, lack of learning and growth, unavailability of IT support and lack of employee participation.

However, the study of Kidist did not consider the supply chain performance and the work of Wubamlak was limited to the procurement department while the Supply Chain Division in the company contains Logistics department, and Supply Strategy and Relations Management departments along with Procurement (Sourcing) department. In addition to that, both studies have

not considered the prospects of the BSC in the company. Thus, it is important to study the application of BSC to identify its prospects and challenges as a measure of supply chain performance including the logistics, the supply strategy and relations management, and the procurement departments since all the three departments together perform the supply chain activities of the company. Hence, this paper attempts to examine the application of BSC as a measure of supply chain performance in ethio telecom.

CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY

3.1. Introduction

This chapter presents description of the study area, research approach, methods and design being used by the study, while highlighting the population and issues related to sampling technique, sample size determination, and data collection instrument. Besides, the chapter outlines the approach to data collection and analysis along with validity and reliability tests and ethical considerations.

3.2. Description of the Study Area

The study is conducted in Ethio telecom, specifically on Supply Chain Division at corporate level. Ethio telecom is government owned Telecom Company in Ethiopia. It is a sole telecom operator in the country since 1894.

With the vision of being a world class telecom operator, the company provides different telecom products and services for its customers. It offers products and services such as mobile, fixed wireless CDMA, fixed line telephone service, different internet services of mobile internet, EVDO (Evolution Data Optimized), ADSL (Asymmetric Digital Subscriber Line), different value added services like CRBT (Caller Ring Back Tone), roaming services which allow the customer access to home services when travelling abroad…etc.

The Supply Chain Division is one of the company's working divisions; which is in charge of availing the necessary goods and services for the successful operation of the company. The division contains three departments of Logistics, Sourcing, and Supply Strategy and Relations Management. It engaged in sourcing of the required items by other divisions of the company through its sourcing department using different procurement methods of direct purchase,

proforma/shopping, restricted bid, and open bid methods both from local and international sources. The customs clearance, the warehousing, inventory control and the distribution of the procured items is done by the logistics department. The Supply Strategy and Relations Management department is in charge of obtaining reliable suppliers and maintaining good supplier relationship management along with contract management to ensure the appropriate performance of contractual obligations both from the suppliers and ethio telecom side. Therefore, the aim of this study is to examine performance of the supply chain division of the ethio telecom in light of the Balanced Scorecard Model. Specifically, it attempts to examine the application of Balanced Scorecard models as a measure of the Supply Chain performance in ethio telecom.

The population of the study comprises the employees of the Supply Chain Division in the corporate (Head Quarter) level of the company. The division involves three departments of Logistics, Sourcing, and Supply Strategy & Relations Management.

As indicated in the payroll sheet of the company, currently, the corporate level Supply Chain Division has 275 members including the management and the staff; from which 160 are males and 115 females. From the department wise, Logistics department has 149 members, Supply Strategy and Relations Management contains 48 and the remaining 78 belongs the Sourcing department.

3.3. Research Approach

The study applied mixed research approach which combines both qualitative and quantitative research methods. According to (Cresswell & Plano, 2011), the use of mixed approach provides a better understanding of research problems and complex phenomena than either approach alone. Hence, this study used both qualitative and quantitative data in order to examine the application of the BSC in measuring the supply chain performance through a mixed research approach to meet the research objectives.

3.4. Research Design

The study used the descriptive research design to examine the application of BSC in measuring the supply chain performance in ethio telecom. The descriptive research design enables to describe a phenomenon and its characteristics (Hussein, 2015). Thus, the descriptive research design is chosen for this study in order to describe the application of BSC in the ethio telecom supply chain division along with its prospects and challenges using both qualitative and quantitative data. Because the study mainly employed the quantitative data through questionnaire and the qualitative data that is obtained through interviews are used to support the quantitative data in clarifying them.

3.5. Population and Sample

3.5.1. Population of the Study

The population of the study is the ethio telecom supply chain division employees both in the staff and management positions at the head quarter. According to the company's Human Resource employees attendance/payroll sheet; currently, there are 275 employees of the supply chain division at the head quarter of which 15 are in the management position and 260 are in the staff level. The study area was at ethio telecom head office located in Addis Ababa, Churchil Road, Lideta sub city at which the employees of the Sourcing, Supply Strategy and Relations Management and part of the logistics department are located. However, some of the employees of the logistics department (i.e. The Warehouse Management and the Inventory Management) teams are located at Addis Ababa, Wollo Sefer, Kirkos sub city, known as "ethio telecom Central Warehouse". Hence, the study considered the employees at both locations.

3.5.2. Sampling Technique and Sample Size

The study used both simple random probability sampling and purposive non-probability sampling. The probability sampling was used to provide equal chance of selection to the entire population for the quantitative data which was obtained through questionnaire. The non-probabilistic

purposive sampling techniques was used through selection of key informants that have more experience and exposure in the implementation of BSC in measuring the supply chain performance of the company through interview for the qualitative data.

The sample size of the study was drawn based on the formula developed by Yamane Taro (1967) since it is a simplified and a widely used formula in similar studies. The formula is given as:

$$n = \frac{N}{1 + N * (e)^2}$$

Where: n= Sample size

N= Population size

e= Tolerance at desired level of confidence, assumed 0.05 at 95% confidence level

Therefore, using the above formula, the sample size is:

$$n = \frac{275}{1 + 275 * (0.05)^2}$$

n = 163

Thus, the sample size was 163 from the population size of 275.

The distribution of the sample across the departments in the supply chain division is proportionally distributed using the below formula:

$$\frac{Total\ No.of\ Employees\ in\ the\ department * the\ sample\ size}{The\ population\ size}$$

Table: 3.1. Sample Size from each Department with response

S/ No	Department	No. of Chief Officer	No. of Director	No.of Manager	No. of Staff	Total No. of Employees	Sample	Response
1	Logistics	1	1	5	142	148	88	68
2	Sourcing		1	5	72	78	46	40
3	Supply Strategy and Relations Management		1	4	43	48	28	23
	Chief Officer					1	1	-
	Total	**1**	**3**	**14**	**257**	**275**	**163**	**131**

Accordingly, out of the 275 employees, questionnaire was distributed to 163 employees. A total of 134 responses were returned of which 3 of them were not effective. Therefore, 131 complete responses were received which represents 80% response rate. The respondents were not fully available at their working areas during the data collection period due to the COVID-19 pandemic situation. Hence, the questionnaire was distributed and collected in different time periods waiting the availability of participants at their working places through some rotations.

In addition to the questionnaire, 6 managers (2 from each department of Logistics, Sourcing and Supply Strategy and Relations Management) were interviewed.

3.6. Data Sources and Types

The study used both primary and secondary data types. The sources of the primary data were questionnaires and interviews from the ethio telecom supply chain division employees at the head quarter level. The secondary data was obtained from ethio telecom BSC evaluation reports.

3.7. Data Collection Procedures

The data collection was initially done through close ended five scale Likert scale questionnaire which ranges from strongly Disagree (1) to Strongly Agree (5) for the sample population of the supply chain division employees and interviews were made for selected managers in order to

obtain more information on the areas that were not covered through questionnaire; because the managers believed to have more background information on the BSC application and they directly participate in the supply chain performance evaluation tasks both before and after the implementation of the BSC model. Hence, semi structured interviews were conducted with section managers in order to improve the data that was collected through questionnaire.

3.8. Validity and Reliability

3.8.1. Validity

Validity refers the extent to which an instrument measures what it is supposed to measure. To ensure precision, relevance and content validity of the instrument, the questionnaire was critical reviewed by the researcher and the advisor; and adjustments were made based on comments. Finally, validation of the instrument was made by the academic advisor prior to the data collection.

3.8.2. Reliability Test

Reliability refers the degree to which consistency of the instrument is maintained. The common method of reliability test is the internal consistency reliability test through the most commonly used measure of the internal consistency known as Cronbach's Alpha Coefficient ((Sekaran and Bougie, 2010). According to Joseph and Rosemary (2003), Cronbach's alpha reliability coefficient (α) normally ranges between 0 and 1 and there is a greater internal consistency of the items if the Cronbach's alpha coefficient approaches to 1. However, any value of Cronbach's alpha that is greater than 0.7 is considered as acceptable based on the rule of thumb outlined by George and Mallery (2003) which stated that if "$\alpha > 0.9$ – 'Excellent', $\alpha > 0.8$ – 'Good', $\alpha > 0.7$ – 'Acceptable', $\alpha > 0.6$ – 'Questionable', $\alpha > 0.5$ – 'Poor', and $\alpha < 0.5$ – 'Unacceptable'."

As shown in the below Table 3.2 the internal consistency of the Balanced Scorecard variables in measuring the supply chain performance were tested using Cronbach's Alpha computed in IBM SPSS statistics 25.0 and the reliability values of all variables fall above 0.7 which are considered as "acceptable".

Table 3.2 Reliability Test of Variable's Using Cronbach's Alpha

Reliability Statistics				
S/No.	**Variable Name**	**Cronbach's Alpha**	**Cronbach's Alpha Based on Standardized Items**	**No. of Items**
1	Prospects of Balanced Scorecard	0.786	0.788	6
2	Prospects Specific to Supply Chain Performance Measures	0.848	0.846	3
3	Challenges of Balanced Scorecard	0.751	0.752	8
4	Alignment of BSC Perspectives	0.771	0.781	5
	Average Value	**0.789**		

Source: Respondents Survey Result Computation in SPSS 25.0, 2020

3.9. Method of Data Analysis

After the data collection, complete questionnaires were identified, coded and categorized to be analyzed using different descriptive statistical tools such as tables, graphs, charts and percentages with the support of the qualitative information. Then the quantitative data was coded to convert the raw data in to numbers and tabulated to count the number of samples falling in to various categories. Moreover, the data was transformed in to Statistical Packages for Social Science (SPSS) for analysis. An IBM SPSS software version 25.0 was used to process the quantitative data through descriptive and inferential statistics.

The descriptive statistics of central tendency measurements such as frequency, frequency distributions, percentages and mean were used to analyze the demographic variables.

The qualitative data obtained through interview was analyzed through narrative descriptions. Therefore, the qualitative data was analyzed in narrative explanations while statistical tools were used for the quantitative data.

3.10. Ethical Considerations

Data collection was made after voluntary consent of respondents. The respondents were assured that the information provided by them shall be kept confidential and used exclusively for academic purpose. The anonymity of the respondents was also maintained. Moreover, all materials and literatures referred, consulted and/or quoted are properly acknowledged. Therefore, the utmost effort was exerted to conduct the study within the acceptable professional ethics.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1. Introduction

With the aim of examining the application of balanced scorecard as a measure of supply chain performance in ethio telecom through identification of its prospects and challenges along with the alignment of the four BSC perspectives with the supply chain performance of the company, this chapter presents the primary data collected through questionnaires and interviews. The questionnaires were collected from employees of the supply chain division while the interviews were conducted with section managers in the supply chain division.

The results and discussion begins with the demographic characteristics and response rate followed by results and interpretation. The findings are presented using descriptive analysis method with supporting data presentation tools such as tables and graphs to show percentages, frequency distributions and mean values. For the descriptive analysis, the IBM Statistical Package for Social Science (SPSS) software version 25.0 is used.

4.2. Response Rate and Demographic Characteristics

This section provides data on the general characteristics of the respondents that participated in the study. The purpose of this analysis is to establish the response rate and to present demographic information, position and experience of the respondents. The findings are presented and explained below.

4.2.1. Response Rate

The participants of the study were ethio telecom employees of the Supply Chain Division which comprises three departments of Logistics, Sourcing and Supply Strategy and Relations Management. Accordingly, 163 questionnaires were distributed and out of which 134 were filled and returned by the respondents. However, three of the returned questionnaires were incomplete

and deemed invalid. Thus, the 131 complete questionnaire responses which comprise 80% of the distributed questionnaire were used for the analysis. Moreover, six managers were interviewed to get more understanding through semi-structured open ended questions. The below table summarizes the response rate:

Table 4.1. Response Rate

No. of Questionnaires Distributed	163
No. of Questionnaires Returned	134
No. of Complete Responses	131
Overall Response Rate	82%
Effective Response Rate used for the Analysis	**80%**

4.2.2. Demographic Characteristics of Respondents

As a general information, respondents were asked to specify their gender, level of education, work experience, department, job position and whether they attended Balanced Scorecard trainings or not. Their responses are described based on the below table:

Table 4.2. Respondents Demographic Characteristics

Demographic Variable	**Specific Category**	**Distribution**		
		Frequency	**Valid Percent**	**Cumulative Percent**
Gender	Female	47	35.9	35.9
	Male	84	64.1	100.0
	Total	131	100.0	
		Frequency	**Valid Percent**	**Cumulative Percent**
Level of Education	Diploma	2	1.5	1.5
	First Degree	94	71.8	73.3
	Second Degree	35	26.7	100.0

Demographic Variable	Specific Category	Distribution		
		Frequency	**Valid Percent**	**Cumulative Percent**
	Total	131	100.0	
		Frequency	**Valid Percent**	**Cumulative Percent**
Work Experience in the organization	0 to 5 Years	22	16.8	16.8
	6 to 10 Years	42	32.1	48.9
	11 to 15 Years	42	32.1	80.9
	Above 15 Years	25	19.1	100.0
	Total	131	100.0	
		Frequency	**Valid Percent**	**Cumulative Percent**
Department	Logistics	68	51.9	51.9
	Sourcing	40	30.5	82.4
	Supply Strategy and Relations Management	23	17.6	100.0
	Total	131	100.0	
		Frequency	**Valid Percent**	**Cumulative Percent**
Job Level	Administrator	37	28.2	28.2
	Specialist	62	47.3	75.6
	Supervisor	22	16.8	92.4
	Management	10	7.6	100.0
	Total	131	100.0	

Source: Survey Result, 2020

As shown in the above table, among the 131 respondents, 64.1% of them were male and 35.9% were female which indicates that most of the respondents were male.

With respect to the educational level, majority of them were first degree holders comprising 71.8% of the respondents followed by second degree holders which 26.7% and only two respondents (i.e. 1.5%) were held diploma; with 83.3% of the respondents acquired more than 5 years of working

experience. This indicated that the participants of the study have obtained sufficient educational background and experience.

All the three departments of Logistics, Sourcing and Supply Strategy & Relations Management of the Supply Chain Division with majority of respondents being "Administrator" and "Specialist" job levels participated in the study.

4.3. The Alignment of Balanced Scorecard Perspectives for Supply Chain Performance Indicators in ethio telecom

One of the objectives of this study was to assess the extent to which the four BSC perspectives are aligned with the supply chain performance in ethio telecom. To this end, five statements were included in the survey and the respondents have put the level of their agreement/disagreement through the 5 point Likert scale. The survey result is summarized in the below table 4.3 and analyzed following it.

Table 4.3 Summary of Survey Result for the Alignment of BSC Perspectives for Supply Chain Performance Indicators in ethio telecom

Item	Statement		Valid						
			Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total	Mean
1	The supply chain performance measures are aligned with financial perspectives such as profit margin, cash flow, income growth, return on assets and etc	Frequency	2	22	24	77	6	131	3.48
		Percent (%)	1.5	16.8	18.3	58.8	4.6	100.0	
2	The supply chain performance measures are aligned with customer perspectives such as quality delivery, on-time delivery, flexibility, value and etc.	Frequency	-	16	15	85	15	131	3.76
		Percent (%)	-	12.2	11.5	64.9	11.5	100.0	

Item	Statement		Valid						
			Strongly Disagree	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**	**Total**	**Mean**
3	The supply chain performance measures are aligned with internal process perspectives such as reduction of delivery time, reduction on cost, flexibility and etc.	Frequency	1	7	16	91	16	131	3.87
		Percent (%)	0.8	5.3	12.2	69.5	12.2	100.0	
4	The supply chain performance measures are aligned with learning and growth perspectives such as innovation of new products & process, information flow, identification of threats and etc.	Frequency	2	55	21	44	9	131	3.02
		Percent (%)	1.5	42.0	16.0	33.6	6.9	100.0	
5	Regular and Periodic supply chain performance evaluations are made in line with the four BSC perspectives (finance, customer, internal process, and learning & growth).	Frequency	1	10	16	92	12	131	3.79
		Percent (%)	0.8	7.6	12.2	70.2	9.2	100.0	
	Average Mean Score								**3.58**

Source: SPSS output of Survey Result, 2020

As shown in the above table, the respondents agreed that among the four BSC perspectives, the three (i.e. finance, customer and internal process) are aligned with the supply chain performance measures in ethio telecom with mean score values of 3.48, 3.76 and 3.87 respectively. In relation to the alignment of the financial perspective with the supply chain performance measures such as profit margin, cash flow, income growth, return on assets and etc, 58.8% and 4.6% of the respondents agreed and strongly agreed respectively totaling 63.4% of the respondents. Whereas the remaining 36.6% had reservations with 18.3% neutral, 16.8% disagreed and 1.5% strongly

disagreed. This result is similar with the finding of Ashioya (2013) in the case of Kenya Nut Company in the study aimed at establishing the extent to which the BSC measures have been used in measuring the supply chain performance. The financial measures of BSC also found to be aligned with the supply chain performance measures in Cadila Pharmaceuticals as revealed by the study of Yenesew (2018). Thus, the financial perspective of the BSC is aligned with the supply chain performance of ethio telecom as well; as shown in the survey result.

Regarding the alignment of the customer perspectives with supply chain performance measures such as quality delivery, on-time delivery, flexibility, value to customers and etc, 76.3% (i.e. 64.9% agreed and 11.2% strongly agreed) of the respondents agreed that the supply chain performance measures of the company is aligned with the customer perspective of the BSC. However, 12.2% of the respondents disagreed and the remaining 11.5% were neutral. This implies that the customer perspective of the BSC is aligned with the ethio telecom supply chain performance measures. This result is also similar with the result of Yenesew (2018) in the case of Cadila Pharmaceuticals.

81.7% of the respondents (with 69.5% agreed and 12.2% strongly agreed respectively) affirmed that the supply chain performance measures of the company are aligned with the BSC internal process perspective. Only 6.1% of the respondents disagreed on the statement with 12.2% remained neutral. Hence, it can be deduced that the supply chain performance measures are aligned with internal process perspectives such as reduction of delivery time, reduction on cost, flexibility and etc. The alignment of the internal process perspective with the supply chain performance measures is very crucial as Kaplan and Norton (2004) stated that the internal process perspective identifies the critical few processes that create and deliver the differentiating customer value propositions. The study of Yenesew (2018) in the case of Cadila Pharmaceuticals also found good internal process perspective alignment with the supply chain performance measures.

Similar result was found from the interview. The interview question was in relation to the alignment of the four BSC perspectives (i.e. finance, customer, and internal process and learning

and growth perspectives) with the supply chain performance measures. All the respondents agreed that the supply chain performance measures are aligned with the four BSC perspectives. However, the learning and growth perspective needs further improvements due to the fact that the capacity building plans were seldom implemented. This is consistent with the supply chain division annual performance evaluation result of the 2011 Ethiopian fiscal year in which the supply chain division has got below 80% in the learning and growth perspective while achieving above 90% in the other BSC perspectives. Moreover, the questionnaire result also shows lower alignment of the learning and growth with mean of 3.02 as compared to the other perspectives.

There is availability of alignment of the BSC perspectives with the supply chain performance in ethio telecom as indicated by both the survey and the interview result. This is crucial to achieve the prospects of BSC in performance measurement since BSC is a performance management system used to align vision and mission with customer requirements and it allows to measure financial and customer results with organizations capacity as stipulated in the study of Mathiyalagan, et.al, (2014). Furthermore, the alignment of BSC perspectives with supply chain performance indicators promotes collaboration of supply chain members to improve the performance of the whole chain (Thales, et.al, 2014).

Moreover, whether regular and periodic supply chain performance evaluations are made in line with the four BSC perspectives is affirmed by the respondents 70.2% agreement and 9.2% strong agreement. Though 8.4% disagreement and 12.2% neutral responses were observed, the survey result witnessed the availability of regular and periodic supply chain performance evaluations in line with the four BSC perspectives (finance, customer, internal process, and learning & growth). This is congruent with the interview result on which the respondents confirmed that the availability of BSC evaluation in supply chain division twice a year.

But 59.5% of the respondents had reservation with the learning and growth perspective alignment of the supply chain performance measures with 42% disagreed, 16% neutral and 1.5% strong disagreement. Thus, only 40.5% of the respondents agreed on the alignment of the supply chain

performance measures with the learning and growth BSC perspective. Hence, the supply chain performance measures are not well aligned with learning and growth perspectives such as innovation of new products & process, information flow, identification of threats and etc. Similar result was found by Kidist (2017) in the case of the customer service division of ethio telecom. Her result indicated that the learning and growth aspect of the BSC is below the expected. Therefore, it is important to focus on this perspective for further improvements. Because according to Jorge and Mario (2014), learning and growth of employees is the foundation for innovation and creativity. It prescribes for the achievement of vision and ability to change (Kaplan and Norton, 2014). It guides the organization on where to focus its training fund. The concentration is on employee training to improve performance. Also this perspective ensures creation and maintenance of corporate culture attitudes that would result in the achievement of vision (Rowland, 2015).

Therefore, the supply chain measures of the ethio telecom are aligned with the four BSC perspectives along with regular and periodic review with the average mean score of 3.58 except the learning and growth perspective. The average mean score is categorized as 0.01 to 1.00 for strongly disagree, 1.01 to 2.00 for disagree, 2.01 to 3.00 for neutral, 3.01 to 4.00 for agree and 4.01 to 5.00 for strongly agree as a rule of thumb. Thus, the average mean score of the alignment of the BSC perspectives to the supply chain performance of ethio telecom is 3.58 which is in the range of 3.01 to 4.00 which is in turn categorized as agree. Therefore, from the result of the average mean score also, the respondents on average agreed the availability of alignment of the four BCS perspectives along with regular and periodic supply chain performance evaluations.

4.4. The Benefits of Using Balanced Scorecard for Supply Chain Performance Measurement

4.4.1. General Prospects of Using Balanced Scorecard in ethio telecom Supply Chain

The respondents were requested to indicate how much they agree or disagree through a Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree) with the statements concerning the prospects of the Balanced Scorecard in measuring performance in ethio telecom. Accordingly, the results of the response are summarized and presented with the below table:

Table 4.4.1 Summary of Survey Result for the General Prospects of Using BSC in ethio telecom Supply Chain

Item	Statement		Valid						
			Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total	Mean
1	The application of the Balanced Scorecard in supply chain division helped to increase my knowledge of the organization's strategy	Frequency	–	4	16	79	32	131	4.06
		Percent (%)	–	3.1	12.2	60.3	24.4	100.0	
2	The supply chain Balanced Scorecard measures clearly demonstrate how we contribute to the achievement of overall organizational goals	Frequency	–	6	10	89	26	131	4.03
		Percent (%)	–	4.6	7.6	67.9	19.8	100.0	
3	Our measures represent an appropriate balance among the four Balanced Scorecard perspectives	Frequency	1	10	30	76	14	131	3.70
		Percent (%)	0.8	7.6	22.9	58.0	10.7	100.0	
4	We review our Balanced Scorecard results on a regular basis	Frequency	2	17	38	68	6	131	3.45
		Percent (%)	1.5	13.0	29.0	51.9	4.6	100.0	

Item	Statement		Valid						
			Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total	Mean
5	Analyzing Balanced Scorecard results allows us to identify potential improvement initiatives	Frequency	1	3	12	86	29	131	4.06
		Percent (%)	0.8	2.3	9.2	65.6	22.1	100.0	
6	Managers and employees are held accountable for achieving Balanced Scorecard results	Frequency	1	9	31	74	16	131	3.73
		Percent (%)	0.8	6.9	23.7	56.5	12.2	100.0	
	Average Mean Score								**3.84**

Source: SPSS output of the Survey Result, 2020

As shown in the above table 4.4.1, six statements (Items) were provided to measure the extent to which the respondents agree or disagree based on the Likert scale for examining the prospects of the Balanced Scorecard (BSC) in measuring the supply chain performance in ethio telecom.

The first item **(Item no. 1)** was to identify whether the application of BSC helped to increase employees' knowledge about the company's strategy. In response to the query, 84.7% of the respondents confirmed that the application of the BSC improved the knowledge of the employees regarding organization's strategy (with 60.3% agreed and 24.4% strongly agreed). However, the remaining 15.3% had reservations (i.e. 12.2% neutral and 3.1% disagreed). This implies that the application of BSC as a measure of supply chain performance helped to improve knowledge of the employees about the overall organizational strategy of the company with mean value of 4.06.

This result is in line with the benefits of BSC outlined by Kaplan and Norton (1996) as they explained gaining consensus on strategy and aligning departmental and personal goals to strategy are among the benefits of BSC. In relation to supply chain performance, it is also congruent with the study of Jorge and Mario (2014) in which they described that BSC provides the ability to link

organizational strategies with supply chain operational activities and it allows employees to understand the strategy and objectives of the company.

Item No. 2 was about whether the supply chain BSC measures clearly demonstrate how the employees contribute to the achievement of overall organizational goals. Majority of the respondents agreed or strongly agreed with 67.9% and 19.8% respectively that the supply chain BSC measures have clear demonstrations how to contribute the achievement of the overall organizational goals; indicating that the application of BSC in the supply chain division helped the employees to have plain manifestations for the contribution of the overall organizational goals of the company with mean value of 4.03 even though 4.6% of the respondents disagreed in the statement and 7.6% were neutral. According to Nanni, et.al, (1992), performance measurement is the process of ensuring that an organization pursues strategies that lead to the achievement of overall goals and objectives. Thus, it can be said that the application of BSC in ethio telecom supply chain helped its employees to know how they can contribute to the achievement of the organizational goals.

The third inquiry was to examine the appropriate balance of the four BSC perspectives (i.e. finance, customer, internal process and growth) was maintained in the supply chain BSC measures. In response to the item, 68.7% of the respondents agreed with 10.7% of them strongly agreed that there is appropriate balance between the four BSC perspectives in the supply chain BSC measures of the company. 22.9% of the respondents doubted and 8.4% disagreed. From this, one can infer the availability of appropriate balance between the four BSC perspectives in the supply chain BSC measures though the mean value (i.e. 3.7) is relatively lower than the above two items. This result affirms the theoretical concept of achieving appropriate balance between financial and non-financial measures. As explained by Kaplan and Norton (1996), the information from the four perspectives provides balance between external measures and internal measures. According to Jorge and Mario (2014), the BSC recognizes the importance of intangible assets in value creation beside financial measures. This alternative approach “balanced” financial and operational

measures and allows the organization to control corporate performance in a multi-dimensional concept, simultaneously.

Regarding the regular review of the BSC results, 51.9% and 4.6% of the respondents agreed and strongly agreed respectively while 29%, 13% and 1.5% of them had reservations responding as neutral, disagree and strongly disagree respectively. This indicates that 56.5% agreement and 43.5% reservation with mean value of 3.45. However, this result contradicts with the result of Wubamlak (2016) who found that lack of periodic monitoring of performance progress was one of the bottlenecks of the BSC application in the procurement department of ethio telecom. This contradiction might arise either due to improvements made on the BSC application after 2016 or the participation of other two departments of logistics and supply strategy and relations management with larger samples in this study might obtain different result due to differences in adherence to the BSC application across departments. The interview result in this study was also consistent with the survey result in a way that most of the respondents confirmed the availability of periodic review though few of them were doubtful in this regard.

The last two items were to analyze whether the BSC results allowed identifying potential improvement initiatives and whether there is accountability for the achievement of the BSC results. According to the survey result, the BSC helped to identify potential improvement areas, and managers and employees are held accountable for the success of the BSC results with mean values of 4.06 and 3.73 respectively. In terms of the Likert scale, 87.8% and 68.7% agreed or strongly agreed on both items respectively while 12.2% and 31.3% had reservations respectively.

The finding about the identification of potential improvement initiatives coincides with the theoretical argument of the BSC benefits as outlined by Bhagwat and Sharma (2007) that the application of BSC ensures cost reduction and product differentiation initiatives.

Therefore, as the survey result conveys, the application of BSC as a measure of supply chain performance in ethio telecom has brought the above mentioned benefits with the average mean score 3.84 which is under the category of agree.

In relation to the general BSC benefits of the supply chain, an interview question was about which supply chain activities are incorporated in the BSC measures. According to the respondents, improving customer satisfaction, improving resource utilization, purchase cost reduction through competition and negotiations, delivery time reduction, material distribution, strategic partnership enhancement, quality assurance, improvement through use of IT and automation in the supply chain activities, implementation of new working processes, and employee capacity building through internal and external trainings are included in the BSC measures. The activities mentioned by the interviewees are also mentioned in the supply chain annual BSC evaluation documents. However, some specific criteria with respect to each BSC perspective are not included. Such specific criteria are mentioned in the work of Mathiyalagan, et.al, (2014) based on each BSC perspective. Accordingly, market share, annual sales growth and profit margin which are sub factors of the financial perspective are not linked with BSC measures of the ethio telecom supply chain. In relation to customer and learning perspectives, accuracy of delivery forecast and cycle time for new product development are not maintained. Moreover, inventory replenishment cycle time and cash to cash cycle time are not included. Hence, it can be inferred that only general supply chain activities are incorporated in the BSC measures. Thus, specific indicators of supply chain performance that relate customer, finance, internal process and learning perspectives need to be in place in order to achieve supply chain performance improvement (Thales, et.al, 2014). Moreover, according to Verdecho, et.al, (2009), alignment of BSC with supply chain performance measurements should include additional collaborative components like equity, trust and commitment (cited by Thales, et.al, 2014).

Therefore, the alignment of BSC with the supply chain performance indicators in ethio telecom can adapt different improvement initiatives using the above stated elements.

4.4.2. Prospects of Balanced Scorecard Specific to Supply Chain Performance

In addition to the above general prospects of the BSC in measuring the supply chain performance, it was attempted to identify the very specific supply chain prospects derived from the application

of BSC in ethio telecom. To this end, three survey questions were included in the questionnaire to analyze whether the application of BSC has enhanced the supply chain management goals (i.e. cost and delivery time reduction), supply chain management results (i.e. quality deliverables, flexibility, value to customers, income growth and return on assets) and supply chain management rate of improvements like innovation of products and processes, information flow, partnership management and identification of threats and substitutes. Accordingly, the results of the response are summarized and presented with below table:

Table 4.4.2 Summary of Survey Result for the Prospects of BSC Specific to Supply Chain Performance in ethio telecom

Item	Statement		Valid						
			Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total	Mean
1	The application of BSC improved the supply chain management goals such as reduction of delivery time and cost	Frequency	-	12	15	80	24	131	3.89
		Percent (%)	-	9.2	11.5	61.1	18.3	100.0	
2	The application of BSC improved the supply chain management results such as quality deliverables, flexibility, value to customers, income growth and return on assets	Frequency	1	16	18	80	16	131	3.72
		Percent (%)	0.8	12.2	13.7	61.1	12.2	100.0	
3	The application of BSC enhanced the rate of improvement in the SCM such as innovation of products and processes, information flow, partnership management and identification of threats and substitutes	Frequency	1	19	34	66	11	131	3.51
		Percent (%)	0.8	14.5	26.0	50.4	8.4	100.0	
	Average Mean Score								**3.71**

Source: SPSS Output of Survey Result, 2020

As shown in the above table 4.4.2, the respondents agreed that the application of BSC has brought benefits specific to supply chain management with respect to its goals of cost and delivery time

reduction, its results of quality assurance, flexibility, value to customers, revenue growth and return on assets; and its rate of improvements of innovation, information flow, partnership management and identification of threats and substitutes with respective mean values of over 3.5 and the average mean score of 3.71 which is also under the category of agree. In relation to delivery time and cost reduction, 79.4% of the respondents agreed/strongly agreed that the application of BSC improved the supply chain management goals such as reduction of delivery time and cost; and only 9.2% respondents were disagreed while 11.5% remained neutral.

The second item was about quality assurance, flexibility, and value to customers, income growth and return on assets. In these supply chain management results also, the respondents believed that the application of BSC improved the supply chain management results such as quality deliverables, flexibility, value to customers, income growth and return on assets with 73.3% agreement (61.1% agreed and 12.2% strongly agreed) with only 13% disagreement and 13.7% neutral.

The last item in this section was about the supply chain rate of improvement due to the application of BSC in ethio telecom in terms of innovation of products and processes, information flow, partnership management and identification of threats and substitutes. In this regard 58.8% of the respondents agreed or strongly agreed with 26% neutral and 15.3% disagreement. Though lower mean value has scored in this item as compared to the above two items, still it can be concluded that the application of BSC enhanced the rate of improvement in the supply chain management such as innovation of products and processes, information flow, partnership management and identification of threats and substitutes.

Therefore, from the above result, it can be deduced that the application of BSC in ethio telecom supply chain enhanced specific supply chain goals, results and rate of supply chain improvements explained by reduction in cost and delivery time, quality assurance, flexibility, value to customers, income growth, return on assets, innovation of products and processes, partnership management and identification of threats and substitutes. This result is consistent with the link between supply chain management (SCM) and BSC indicated by Brewer and Speh (2000). According to the authors, the SCM goals of waste reduction, time compression, flexible response and unit cost

reduction are linked to the internal business process perspective; the SCM aims of improved product/service quality, improved timeliness, improved flexibility and improved value are connected to the customer perspective; the SCM objectives of higher profit margins, improved cash flows, revenue growth and higher return on asset have linked to the financial perspective of the BSC. Moreover, the SCM improvement requirements of product/process innovation, partnership management, information flow, threats/substitutes are associated with the innovation and learning perspective.

Open ended interviews question whether the application of BSC improved the supply chain performance of the company was asked to the interviewees. Most of the respondents believe that the supply chain performance showed improvement in terms of delivery lead time reduction, purchasing cost reduction, improvement in material distribution, and partnership management. However, some of the respondents had reservations in a way that though some improvements were found in the supply chain through the application of BSC. There is no as such improvement particularly in capacity building of employees which is against the learning and growth perspective of the BSC. The interview result is congruent with the survey findings. However, in order to capitalize the benefits of the BSC particular to the supply chain performance, it is important to apply the suggestion of Bhagwat and Sharma (2007) which includes awareness creation for the model of BSC to supply chain management, acquiring sufficient information on supply chain management strategy along with the four BSC perspectives and clear definition of specific supply chain goals. It is also required to set goals for time, quality, and performance and service so that the goals need to be translated in to specific measures.

According to Kyung (2014), establishing the right supply chain performance measures is crucial to evaluate organizational performance and to set up strategic objectives for the effective management of goals and activities. Hence, consideration of clear definition of specific supply chain goals along with setting the right supply chain measures is important for further improvements in attaining the benefits of BSC specific to the supply chain performance in ethio telecom.

4.5. Challenges of Balanced Scorecard in Measuring Supply Chain Performance

Identifying the challenges of the BSC as a measure of supply chain performance in ethio telecom was one of the objectives of the study. Accordingly, survey questions were distributed on the challenges of the BSC in measuring the supply chain performance. The survey result is summarized in the below table 4.5.

Table 4.5 Summary of Survey Result for the Challenges of BSC in Measuring Supply Chain Performance in ethio telecom

Item	Statement		Valid						
			Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total	Mean
1	The organizational culture (process & structure) of ethio telecom negatively affected the application of BSC in supply chain management	Frequency	7	78	19	26	1	131	2.51
		Percent (%)	5.3	59.5	14.5	19.8	0.8	100.0	
2	Lack of integration of BSC with other control systems impacted the application of BSC in the supply chain management	Frequency	1	29	27	65	9	131	3.40
		Percent (%)	0.8	22.1	20.6	49.6	6.9	100.0	
3	Much attention is given to financial measures than the other BSC perspectives (i.e. customer, internal process and learning & growth) in the application of BSC in the supply chain management	Frequency	4	34	30	54	9	131	3.23
		Percent (%)	3.1	26.0	22.9	41.2	6.9	100.0	
4	The BSC performance measures of the supply chain are NOT linked to the reward systems of the company	Frequency	14	64	23	26	4	131	2.56
		Percent (%)	10.7	48.9	17.6	19.8	3.1	100.0	
5	There is lack of senior management involvement	Frequency	7	55	35	32	2	131	2.75

Item	Statement		Valid						
			Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total	Mean
	in the application of BSC in the supply chain management	Percent (%)	5.3	42.0	26.7	24.4	1.5	100.0	
6	There is lack of communications and feedback from employees on the contents and rationale for the BSC in supply chain management	Frequency	2	47	24	52	6	131	3.10
		Percent (%)	1.5	35.9	18.3	39.7	4.6	100.0	
7	There is failure to relate key measures of supply chain to performance drivers	Frequency	2	43	36	48	2	131	3.04
		Percent (%)	1.5	32.8	27.5	36.6	1.5	100.0	
8	The reporting tool we use is NOT efficient	Frequency	5	28	23	71	4	131	3.31
		Percent (%)	3.8	21.4	17.6	54.2	3.1	100.0	
	Average Mean Score								**2.99**

Source: SPSS output of Survey Result, 2020

As shown in the above table, eight items were provided to identify the challenges of BSC as a measure of supply chain performance in ethio telecom. Accordingly, the respondents put their agreement or disagreement on the statements and their responses presented as follows:

Regarding the first item which requires identifying whether the organizational culture of ethio telecom negatively affected the application of BSC in the supply chain management, most of the respondents not agreed with 59.5% and 5.3% disagreed and strongly disagreed respectively. Whereas the rest 14.5%, 19.8% and 0.8% remained neutral, agreed and strongly agreed respectively. From this, it can be said that the organization culture of ethio telecom was not a challenge to apply the BSC in the supply chain management. The mean score of the item is 2.51 indicating higher disagreement of the respondents.

The organizational culture is one of the bottlenecks for the success of the BSC application in organizations such as in Kenyatta National Hospital as studied by Rowland (2015) in which complaisant organizational culture was one of the challenges of BSC application in the hospital and in Development Bank of Ethiopia as identified by Tsion (2014), poor organizational culture impacted the application of BSC in the bank. However, in ethio telecom supply chain division, the organizational culture was not challenged the application of the BSC as shown in the finding of the survey result.

The second and the third item sought to analyze whether there is lack of integration between BSC and other control systems, and whether much attention was given to the financial measures only. Based on the survey result, the respondents confirmed the availability of lack of integration and more focus on financial measures with mean values of 3.40 and 3.23 respectively. In terms of the Likert scale only 22.9% of the respondents were not agreed (i.e. 22.1% disagreed and 0.8% strongly disagreed) while 77.1% agreed or remained neutral with 49.6% agreed, 6.9% strongly agreed and 20.6% neutral respectively for the lack of integration. For the much attention on financial measures, majority of the respondents (i.e. 77.1%) of them agreed (41.2%), strongly agreed (6.9%) or neutral (22.9%). This indicates that the application of the BSC in ethio telecom supply chain division is hindered by lack of integration with other control systems and through provision of much attention on the financial measures than the other BSC perspectives of customer, internal process and learning and growth.

The result is parallel with the BSC application issues addressed in different literatures. According to Manyi (2016), different issues that hinder the application of BSC are indicated in literatures including lack of integration with other control tools and information system and much attention on financial measures with minimal attention to the other BSC perspectives so that the four perspectives of the BSC couldn’t be balanced.

The other item was to identify whether the BSC measures are not linked to the reward system. In response to this item, most of the respondents believe that the BSC measures of the supply chain

are linked to the reward scheme of the organization. This is explained by 10.7% and 48.9% strongly disagreed and disagreed responses of summed up 59.5% for the negative statement. Whereas the rest 17.6%, 19.8% and 3.1% responded as neutral, agreed and strongly agreed respectively. Therefore, the supply chain BSC measures of ethio telecom are linked with the reward system with mean value of 2.56.

Failure to link the BSC measures with the reward system of the company is also one of the challenges as indicated by Manyi (2016) and the study of Stephen and Gabriel (2012) on Essar Telecom Kenya Limited also found that lack of linkage between the BSC and employee reward was one of the challenges in the application of BSC. However, in ethio telecom, the application of BSC is linked with the reward system of the company as the survey result of this study implied. Similar result was found by the work of Wubamlak (2016) in procurement department of the company.

In relation to senior management involvement in the application of BSC in the supply chain division of ethio telecom, 47.3% of the respondents consider that there is senior management involvement in the application of BSC. This is explained by 5.3% and 42% strong disagreement and disagreement respectively. The 26.7% of respondents doubted, 24.4% and 1.5% considered lack of senior management involvement with agreed and strongly agreed scale of responses respectively. Thus, it can be deduced that there is senior management involvement in the application of BSC with mean value of 2.75. This result is different from what is found by Kidist (2017) in the Customer Service division of ethio telecom. Her result indicated that lack of top management support was one of the challenges in the implementation of BSC in the customer service division. The difference might be due to differences in the application of BSC across working division of the company. The same challenge was identified in Development Bank of Ethiopia as indicated in the works of Tsion (2014) and Dawit (2015).

The remaining items that were stipulated to identify the challenges of BSC in supply chain management of ethio telecom were whether there is lack of communication, failure to relate key

measures of supply chain to performance drivers and lack of efficient reporting tool respectively. Accordingly, most of the respondents considered the occurrence the challenges with mean scores of 3.1, 3.04 and 3.31 respectively. This is detailed through 62.6% agreement and neutral response with 37.4% disagreement for the lack of communication, 65.6% agreement and neutral with 34.4% disagreement for the failure to relate key measures of the BSC to the supply chain performance drivers and 74.8% agreement and neutral with 25.2% disagreement for the use of inefficient reporting tool.

The study by Bhagwat and Sharma (2007) was also identified the challenge of failure to relate key measures of supply chain to performance drivers and failure to communicate the contents and rationale for the balanced supply chain management scorecard in their empirical study on three Indian small and medium enterprises. Lack of effective strategy communication is also similar with result of Hazeline, et.al (2010) on Malaysian Corporation. According to Thuo (2012), good communication enhanced the proper implementation of BSC in Safarikom Kenya Limited. Though this study revealed that lack of communication is one of the challenges in the application of BSC in supply chain division of ethio telecom, the opposite result was obtained by Kidist (2017) in the customer service division of the company. This also might be due to intra organizational differences between divisions of the company. Improved reporting technique is also the other necessary factor in the application of BSC (Bhagwat and Sharma, 2007). However, the survey result of this study implies lack of efficient reporting tool. Similar result was revealed by Kidist (2017) in the customer service division of ethio telecom.

Therefore, from the eight statements to identify the challenges in the application of BSC as a measure of supply chain performance in ethio telecom, five of them have found to be existed in the case of ethio telecom supply chain division. These are: Lack of integration of BSC with other control systems impacted the application of BSC in the supply chain management, much attention is given to financial measures than the other BSC perspectives (i.e. customer, internal process and learning & growth) in the application of BSC in the supply chain management, there is lack of communications and feedback from employees on the contents and rationale for the BSC in supply

chain management, there is failure to relate key measures of supply chain to performance drivers and the reporting tool used is not efficient. However, application of the BSC in the supply chain division is not hindered by the organizational culture, failure to link the BSC supply chain measures with reward system and lack of senior management involvement. The average mean score is 2.99 which inclined to upper bound of neutral category indicating that the availability of most of the stated challenges of BSC in measuring supply chain performance of ethio telecom are witnessed.

The interview result also outlined challenges of BSC application in measuring supply chain performance such as inclusion of measures that are difficult to evaluate. For example, improving the customer satisfaction is one of the BSC measures used in the supply chain division. However, customer satisfaction surveys are done in a company level instead of the supply chain division wise. In this case, it is difficult to identify how much the supply chain division contributed for the satisfaction of the ethio telecom customers. This result affirms the need to consider the suggestion of Bhagwat and Sharma (2007) in setting clear goals for time, quality and performance with translating them in to specific measures.

The other challenge mentioned by the interviewees is the weight allocation for the evaluation of the BSC measures is arbitrary. The weighting of different performance drivers is given from the Strategy and Planning division for which the rationale for providing higher weight for one measure as compared to the other was not clear. In this case, working units inclined to achieve only some of the measures which have assigned higher weights. This in turn results in unbalanced score for the BSC perspectives. This contradicts the very essence of the BSC model to create appropriate balance between the four perspectives of finance, customer internal process, and learning and growth by overcoming the limitations of the traditional financial measures (Kaplan and Norton, 1996). According to Jorge and Mario (2014), the BSC recognizes the rise of intangible assets in value creation and the limitations of financial measurements. This alternative approach “balanced” financial and operational measures and allows the organization to control corporate performance in a multi-dimensional concept, simultaneously. Therefore, by allocating “balanced” weights for

the four BSC perspectives, it is essential to keep the BSC measures achieve its original objective in balancing the four perspectives.

One more challenge described by the respondents was failure to relate key measures of supply chain to performance drivers. This is explained by the absence of any measure in the supply chain BSC related to logistics integration and synchronization. This is one of the three common errors of BSC implementation identified by Bhagwat and Sharma (2007). The other errors outlined by the authors were failure to include specific long term objectives and failure to communicate the contents and rationale for the balanced supply chain management scorecard. However, good communication in relating supply chain measures to performance drivers is an important factor to reap the benefits of balanced scorecard (Thou, 2012). Therefore, it is viable to establish appropriate supply chain performance drivers in the application of BSC.

Finally, the last question for the interviewees was to provide recommendations to improve the performance measurement of the supply chain using BSC in ethio telecom. The respondents recommended providing regular trainings on the supply chain BSC in order to create similar level of understanding between employees, to review the supply chain performance measures in line with the BSC perspectives and provide more focus on the learning and growth perspective.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1. Introduction

This chapter presents the summary of findings, conclusions and recommendations of the study based on the data analysis and discussions in the previous chapter.

5.2. Summary of the Major Findings

The study was conducted to examine the application of balanced scorecard (BSC) as a measure of supply chain performance in ethio telecom. It attempted to identify the prospects and challenges of BSC as a measure of supply chain performance along with assessing the alignment of the four BSC perspectives of finance, customer, internal process and learning and growth are with the supply chain performance in ethio telecom.

Mixed research approach was used to meet the objectives of the study with quantitative data collected through questionnaire and qualitative data obtained through interview. Accordingly, questionnaire was distributed to the sample size of 163 respondents and 131 complete responses were returned with a response rate of 80%. Moreover, six section managers in the supply chain division were interviewed with semi-structured open ended questions to get more elaboration on some points. Cronbach's alpha reliability test was done for the internal consistency of the questionnaire items and it was found "acceptable" with average alpha value of ($\alpha = 0.789$).

Descriptive research design was used to analyze the collected data using frequency and percentage tables and charts with the help of SPSS 25.0 software in order to address the research questions.

The first research question of this study was to assess the alignment of the BSC perspectives with the supply chain performance measures. The survey result indicated that the supply chain performance measures are linked with the four BSC perspectives. But the learning and growth

perspective was lower alignment with the supply chain performance. This is shown both in the survey and the interview result.

The second and third research question of the study was identifying the general benefits BSC as a measure of supply chain performance in ethio telecom and prospects of using BSC for specific supply chain performance measurements respectively. Nine items with six of them for general prospects and three of them to analyze the prospects of BSC specific to supply chain performance measures were provided and accordingly the result revealed that, all of the benefits were achieved due to the application of BSC with average mean value of 3.79. The interview result also witnessed that the application of BSC improved delivery lead time, saving from purchasing, material distribution and partnership management. However, such improvements were not found in capacity building of employees.

The last research question was about the challenges of BSC as a measure of supply chain performance. The questionnaire response result showed that lack of integration with other control systems, giving much attention to financial measures than the other perspectives, lack of communication, failure to relate key measures of supply chain to performance drivers and lack of efficient reporting tool were the challenges faced by ethio telecom supply chain division in the application of BSC. There are also other challenges outlined by the interviewees such as inclusion of measures that are difficult to evaluate and arbitrary weight allocations for the evaluation of the BSC measures. However, organizational culture, link of BSC measures with reward system and senior management involvement were not bottlenecks for the application of BSC.

5.3. Conclusions

The result of the study provides an important insight to conclude on the application of BSC in measuring supply chain performance in ethio telecom.

Based on the result, the four perspectives of the BSC (finance, customer, internal process and learning) are aligned with the supply chain performance measures except the learning and growth perspectives. This is due to that the education and training plans to abide with the learning and growth perspective of the BSC in the supply chain division is not appropriately implemented.

Encouraging benefits such as improvements in the knowledge of the organization's strategy, ability to create appropriate balance with the four BSC perspectives of finance, customer, internal process and learning in the supply chain performance measures, ability to identify potential improvement initiatives and regular review of the BSC results with accountability are obtained from the application of the model. Moreover, specific supply chain prospects are also achieved in terms of delivery time and cost reduction, quality improvements, flexibility, value to customers, partnership management and revenue growth.

However, a number of challenges are also identified. The major challenges are lack of integration of BSC with other control systems, more emphasis on financial measures than the other BSC perspectives of customer, internal process and learning and growth, lack of communications and feedback from employees, failure to relate key measures of supply chain to performance drivers and lack of efficient reporting tool.

Apart from this, organizational culture, linking BSC performance measures with reward system and senior management involvements are found to be good.

Therefore, the study concludes that even though encouraging benefits are achieved from the application of BSC in measuring supply chain performance which needs to be capitalized, there are certain challenges which have to be appropriately addressed.

5.4. Recommendations

The following recommendations are forwarded based on the findings of the study.

- The survey and the interview result revealed that there is lack of integration of BSC with other control systems. This is also consistent with what was revealed by Kidist (2017) that indicated the lack of IT support in the case of customer service division of the company Therefore, there should be integration of the BSC with other control systems such as with ERP (Enterprise Resource Planning) and Data Warehouse Business Intelligent systems which are deployed by the company. Through this, the reporting tool can also be improved.
- The result implied that much attention was given to financial measures than the other perspectives. Therefore, balanced approach to all the four perspectives of the finance, customer, internal process, and learning and growth is recommended.
- Communication and feedback involves paramount importance in the application of BSC in general and in the case of supply chain in particular. Because supply chain consists a number of participants both in inter and intra organization level. However, the result of this study showed the lack of communication in this regard. Therefore, improvements in the communication through the support of different information system communication mechanisms such as integration of BSC platforms with ERP system need to be in place.
- Key supply chain measures such as integration and synchronization are not related with the BSC as the interview result elaborated. Thus, there is failure to relate key measures of supply chain to performance drivers. Therefore, there should be critical review of the supply chain measures in order to include performance drivers such as cash to cash cycle time, quality deliverables, procure to pay lead times, facilities, … for the better achievement of the supply chain performance.
- The learning and growth is one of the BSC perspectives that require equal attention with the other perspectives. Because it provides ample benefits in innovation of new products & process, information flows, identification of threats and substitutes etc. However, the finding of this study revealed that lower focus was given to the learning and growth

perspective as compared to the other BSC perspective. Hence, it is recommended to abide by the learning and growth perspective through capacity building activities such as training and education of employees.

5.5. Suggestions for Further Study

This study was conducted to examine the application of BSC as a measure of supply chain performance in ethio telecom using descriptive research design. Since the study was limited to the supply chain division of the company, similar studies are recommended for the other ethio telecom working divisions in order to have general picture at the company level.

This study used the descriptive research design and identifying the effect of the application of BSC on ethio telecom supply chain performance through explanatory research design can be another investigation area to get specific results on the impact of BSC on the supply chain performance of the company.

Moreover, similar and related studies on other organizations also suggested for getting wider implications on the application of BSC particularly from the supply chain viewpoint.

REFERENCES

Ashioya, I.B (2013); The Balanced Scorecard and Supply Chain Performance: A case of Kenya Nut Company, Master's Thesis, University of Nairobi, School of Business

Atkinson, H. (2006). Strategy implementation. a role for the Balanced Scorecard? Management Decision. Vol. 44, No.10

Barbara, B. and Eleonora, B. (2010). Performance measurement in the food supply chain. a balanced scorecard approach, Vol. 28 No. 5/6, 2010, pp. 249-260, Emerald Group Publishing Limited, 0263-2772

Bhagwat, M. and Sharma, M.K. (2007). Performance Measurement of Supply Chain Management. A Balanced Scorecard Approach. Computer & Industrial Engineering, 53. 43-62. DOI. 10.1016/j.cie.2007.04.001

Bose, S., and Thomas, K.(2007). Applying the Balanced Scorecard for Better Performance of Intellectual Capital, Journal of Intellectual Capital, 8 (4), 653-665.

Brewer, P.C., &Speh, W., (2000). Using the Balanced Scorecard to Measure Supply Chain Performance, Journal of Business Logistics, Volume 21, No. 1, 2000

Callado, A. and Jack, L. (2015). Balanced Scorecard Metrics and Specific Supply Chain Roles, International Journal of Productivity and Performance Management, 64(2).288-300

Chan, Y.-C. L. (2004). Performance Measurement and Adoption of Balanced Scorecards: A Survey of Municipal Government in the USA and Canada. International Journal of Public Sector Management 17(3), 204-221.

Cooper M., Lambert, D. and Pagh D. (1997). Supply Chain Management. More than a New Name for Logistics, The International Journal of Logistics Management, Volume 8, Number 1, 1997

Creswell, J. W., & Plano, V. L. (2011). Designing and Conducting Mixed Methods Research (2nd ed.). Thousand Oaks, CA. Sage Publications, Inc.

Dawit, H. (2015). Prospects and Challenges of Balanced Scorecard Implementation. A Case of Development Bank of Ethiopia, Master's Thesis, St. Mary University, Addis Ababa

Emad, A. and Amir, A. (2015). A Critique of the Balanced Scorecard as a Performance Measurement Tool, International Journal of Business and Social Science, Vol. 6, No. 7; July 2015

Ezutah, O. and Kuan, W. (2009). Supply Chain Performance Evaluation: Trends and Challenges, American J. of Engineering and Applied Sciences 2 (1). 202-211, 2009, ISSN 1941-7020

Fahmi, F. and Saudah, S. (2015). A Review of Balanced Scorecard Framework in Higher Education Institution (HEIs), International Review of Management and Marketing, Vol. 5, No. 1, 2015, pp.26-35, ISSN. 2146-4405

Ferdoush, S., Mamun, H., Zurina, H. (2018). Supply Chain Performance Measurement Model: A Literature Review, International Journal of Supply Chain Management, IJSM, Vol. 7, No. 3, June 2018, ISSN. 2050-7399 (online), 2051-3771 (print)

George, D., &Mallery, P. (2003). *SPSS for Windows step by step: A simple guide and reference* (4th ed., Vol. 11.0 update). Boston: Allyn & Bacon.

Hazeline, A., Normah, O., Ibrahim, K. and Faridah, M. (2010). Balanced Scorecard (BSC) Strategy Alignment: Case Study of a Malaysian Company, ResearchGate, Conference Paper, May, 2010

Henry, W. (2009). The Balanced Scorecard Demystified, https.//www.academia.edu/6562825/The_Balanced_Scorecard_Demystified

Hossein, N. (2015). Qualitative and Descriptive Research: Data Type versus Data Analysis, Language Teaching Research, 2015, Vol. 19(2) 129–132

https://dictionary.cambridge.org . Accessed on May 26, 2020

https.//www.ethiotelecom.et/about-us/. Accessed on November 13, 2019

Ilkka, S. (2015). Empirical Study of Measuring Supply Chain Performance, Benchmarking: An International Journal, Vol. 22 Iss 2 pp. 290 - 308

Janne, K. and Paula, M. (N.d). Balanced Scorecard: Theory and Applications

Jorge, G. and Mario, R. (2014). Advantages and Limitations of Performance Measurement Tools: The Balanced Scorecard, ResearchGate, Conference Paper, February 2014

Joseph, A., Gliem and Rosemary, R. Gliem. (October 8-10, 2003). *Calculating, Interpreting, and Reporting Cronbach's Alpha Reliability Coefficient for Likert-Type Scales*. Midwest Research to Practice Conference in Adult, Continuing, and Community Education. The Ohio State University, Columbus.

Kaplan, R. S. and Norton, D. N. (2004). Measuring the Strategic Readiness of Intangible Assets, Harvard Business Review, February, 2004

Kaplan, R. S. and Norton, D. N. (1992). The Balanced Scorecard - Measures that Drive Performance, Harvard Business Review, January - February, 1992

Kaplan, R. S. and Norton, D. N. (1996). Using the Balanced Scorecard as a Strategic Management System, Harvard Business Review, January - February, 1996

Kaplan, R. S. and Norton, D. N. (2001). The Strategy Focused Organization: How Balanced Scorecard Companies Thrive in the New Business Environment, Harvard Business School Press, Boston, Mass, 2001

Kaplan, R.S. (2010). Conceptual Foundations of the Balanced Scorecard , Harvard Business School, Harvard University, Working Paper 10-074

Kidist, G. (2017). Assessment of Balanced Scorecard Implementation in Ethio Telecom, Maters Thesis, St. Mary University, Addis Ababa

Kyung, C. (2014). Performance Measurement Framework for Engineering Supply Chain, Master's Thesis, Turku University of Applied Sciences, Business Information Systems, 2014

Manyi, W. (2016). Issues of Balanced Scorecard and Its Implication for Chinese Companies, Master's Thesis, Auckland University of Technology, School of Business, 2016

Mathiyalagan, P., Mannan, K. and Parthiban, P. (2014). Performance Evaluation in Supply Chain Using Balanced Scorecard, Int'l Journal of Advances in Mechanical & Automobile Engg. (IJAMAE) Vol. 1, Issue 1(2014) ISSN 2349-1485 EISSN 2349-1493

Mohamed, B. (2014). The Balanced Scorecard in Large Firms and SMEs. A Critique of the Nature, Value and Application, Vol. 3, No. 2; 2014, doi.10.5430/afr.v3n2p14

Mohammadhamed, K., Mahmoud, M. and Nahid M. (2015). The Feasibility of Implementing the Balanced Scorecard (Case Study, Nationwide Provincial Telecom Companies), International Business Research; Vol. 8, No. 8; 2015 ISSN 1913-9004 E-ISSN 1913-9012, Canadian Center of Science and Education

Nadia, H., et.al. (2013). Balanced Scorecard as a Spontaneous Performance Measurement Tool. A Case of Insurance Companies in Pakistan, International Journal of Innovative and Applied Finance, 2013

Najmi, A., Gholamian, M. R., Makui. A. (2013). Supply Chain Performance Models: A Literature Review on Approaches, Techniques, and Criteria, 95 ISSN. 1984-3046 • Journal of Operations and Supply Chain Management Volume 6 Number 2 pp 94 – 113

Nanni, A, Dixton j., Vollman, T. (1992). Integrated Performance Measurement to Support the New Manufacturing Realities: Management Accounting Research, No. 4

Nedaa, A., Mohamed, S. and Mohamed, R. (2012). Supply Chain Performance Measurement Approaches: Review and Classification, Journal of Organizational Management Studies, Vol. 2012 (2012), IBIMA Publishing

Neely, A., Gregory, M. &Platts, K. (1995). Performance Measurement Systems Design: A Literature Review and Research Agenda, International Journal of Operations and Productions Management, 15(4), 80-116.

Ogwang, A. (2017). The Role of Balanced Scorecard In Measuring Supply Chain Performance: A Study of National Oil Corporation of Kenya, Master's Thesis, United States International University-Africa, Summer 2017

Rowland, N. (2015). Challenges of the Balanced Score Card Implementation at Kenyatta National Hospital, Kenya, Master's Thesis, School of Business, University of Nairobi

Sabri, E.H. and Beamon, M. (2000). A Multiobjective Approach to Simultaneous Strategic and Operational Planning in Supply Chain Design. Int. J. Manage. Sci., 1. 581-598. DOI. 10.1016/S0305- 0483(99)00080-8

Sekaran, U. &Bougie, R. (2010). Research Methods for Business: A Skill BuildingApproach (5th ed.). Chichester: John Willey & Sons Ltd.

Stephen, N. and Gabriel, N. (2012). Application of Balanced Scorecard in Performance Measurement at Essar Telecom Kenya Limited, School of Business, University of Nairobi

Thales, S., Carlos C., Kleber E. & Fabio G. (2014). Alignment of Balanced Scorecard Perspectives with Supply Chain Management Objectives: A Literature Review, Independent Journal of Management & Production (IJM&P), v. 5, n. 4, October - December 2014, ISSN. 2236-269X, DOI. 10.14807/ijmp.v5i4.238

Tsion, G. (2014). Challenges and prospects of Balanced scorecard Implementation in the Development Bank of Ethiopia, Master Thesis, Addis Ababa University

Wanjiru, T. (2012). The Challenges of Implementation of the Balanced Scorecard Strategy at Safaricom Kenya Limited, Master's Thesis, School of Business, University of Nairobi

Wong, P.W. and Wong, K.Y. (2007). Supply Chain Performance Measurement System using DEA Modeling. Ind. Manage. Data Syst., 107. 361-381. DOI. 10.1108/02635570710734271

Wubamlak, M. (2016). Assessment of Balanced Scorecard Implementation Practice and its Challenges on Procurement Department in Ethio Telecom, Master's Thesis, Addis Ababa University, School of Commerce, Addis Ababa

Yamane, T. (1967). Statistics: An Introductory Analysis, 2nd Ed. New York. Harper and Row

Yan, H., Yang, Z. (2013). Supply Chain Dynamic Performance Measurement Based on BSC and SVM, IJCSI International Journal of Computer Science Issues, Vol. 10, Issue 1, No 2, January 2013, ISSN (Print). 1694-0784 | ISSN (Online). 1694-0814, www.IJCSI.org

Yenesew, S. (2018). Measuring Supply Chain Performance Using BSC Model. The Case of Cadila Pharmaceutical Plc, Master's Thesis, Addis Ababa University, School of Commerce

APPENDICES

Appendix 1 –Data Collection Instrument – Questionnaire

SECTION A: GENERAL INFORMATION

Please read the questions carefully and feel free to respond by giving your response by ticking (√) on whichever option best describes you or applies to you.

1. Gender

☐ Female ☐ Male

2. Level of Education

☐ Certificate ☐ Diploma ☐ First Degree ☐ Second Degree ☐ Above

3. Work Experience in the organization

☐ 0-5 Years ☐ 6-10 Years ☐ 11-15 years ☐ Above 15 Years

4. Your department

☐ Logistics ☐ Sourcing ☐ Supply Strategy and Relations Management

☐ Other (Please specify) _____

5. Your job level

☐ Management ☐ Supervisor ☐ Specialist ☐ Administrator

6. Have you attended the Balanced Scorecard Training?

☐ Yes ☐ No

SECTION B:

1. Please indicate the extent to which you agree or disagree with the following statements by ticking (√) on your response concerning **the Prospects (benefits) of Balanced Scorecard Card (BSC) to measure Supply Chain Performance in ethio telecom**

No.	Description	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)
1.1	The application of the Balanced Scorecard in supply chain division helped to increase my knowledge of the organization's strategy					
1.2	The supply chain Balanced Scorecard measures clearly demonstrate how we contribute to the achievement of overall organizational goals					
1.3	Our measures represent an appropriate balance among the four Balanced Scorecard perspectives					
1.4	We review the our Balanced Scorecard results on a regular basis					
1.5	Analyzing Balanced Scorecard results allows us to identify potential improvement initiatives					

No.	Description	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)
1.6	Managers and employees are held accountable for achieving Balanced Scorecard results					

1.1. Please indicate the extent to which you agree or disagree with the following statements by ticking (√) on your response concerning **the extent to which the Balanced Scorecard Card (BSC) improved the Supply Chain Performance in ethio telecom**

No.	Description	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)
1.7	The application of BSC improved the supply chain management goals such as reduction of delivery time and cost					
1.8	The application of BSC improved the supply chain management results such as quality deliverables, flexibility, value to customers, income growth and return on assets					
1.9	The application of BSC enhanced the rate of improvement in the supply chain management such as innovation of products and processes, information flow, partnership management and identification of threats and substitutes					

2. Please indicate the extent to which you agree or disagree with the following statements by ticking (√) on your response concerning **the Challenges of the Balanced Scorecard Card (BSC) in measuring Supply Chain Performance of ethio telecom**

No.	Description	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)
2.1	The organizational culture (process & structure) of ethio telecom negatively affected the application of BSC in supply chain management					
2.2	Lack of integration of BSC with other control systems impacted the application of BSC in the supply chain management					
2.3	Much attention is given to financial measures than the other BSC perspectives (i.e. customer, internal process and learning & growth) in the application of BSC in the supply chain management					
2.4	The BSC performance measures of the supply chain are NOT linked to the reward systems of the company					
2.5	There is lack of senior management involvement in the application of BSC in the supply chain management					
2.6	There is lack of communications and feedback from employees on the contents and rationale for the BSC in supply chain management					

No.	Description	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)
2.7	There is failure to relate key measures of supply chain to performance drivers					
2.8	The reporting tool we use is NOT efficient					

3. Please indicate the extent to which you agree or disagree with the following statements by ticking (√) on your response concerning **the alignment of the four perspectives of Balanced Scorecard Card (BSC) which are finance, customer, internal process and learning & growth with the Supply Chain Performance in ethio telecom**

No.	Description	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)
3.1	The supply chain performance measures are aligned with financial perspectives such as profit margin, cash flow, income growth, return on assets and etc.					
3.2	The supply chain performance measures are aligned with customer perspectives such as quality delivery, on-time delivery, flexibility, value and etc.					
3.3	The supply chain performance measures are aligned with internal process perspectives such as reduction of delivery time, reduction on cost, flexibility and etc.					
3.4.	The supply chain performance measures are aligned with learning and growth perspectives such as innovation of new					

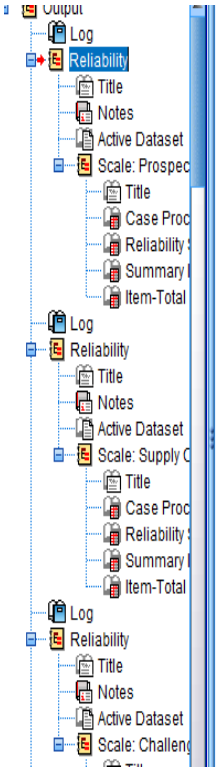
No.	Description	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)
	products & process, information flow, identification of threats and etc.					
3.5.	Regular and Periodic supply chain performance evaluations are made in line with the four BSC perspectives (finance, customer, internal process, and learning & growth).					

APPENDIX 2 - DATA COLLECTION: INTERVIEW FOR MANAGERS

1. Do you think that the BSC in measuring the supply chain is cascaded to individual level in ethio telecom with appropriate trainings?
2. What supply chain activities are incorporated in the Balanced Scorecard (BSC) measures in ethio telecom?
3. Do you think that measuring the supply chain performance using BSC improved the supply chain performance in ethio telecom? How?
4. What are the challenges faced in measuring the supply chain performance using BSC in ethio telecom?
5. Are the four BSC perspective (finance, customer, internal process, and learning and growth) aligned to the supply chain performance in ethio telecom? How?
6. Is there periodic review of the BSC results in the supply chain division?
7. Is there a frequent and regular supply chain performance evaluation with respect to the four BSC perspectives?
8. What improvements can be recommended in the performance measurement of the supply chain using BSC in ethio telecom?

==========///==========

APPENDIX 3 – RELIABILITY TEST RESULT



Reliability

[DataSet7] C:\Users\DELL\Downloads\books\LSCM@Commerce\For Thesis-LSCM\Measuring Supply Chain Performane\BSC_Prospects.sav

Scale: Prospects of Balanced Scorecard

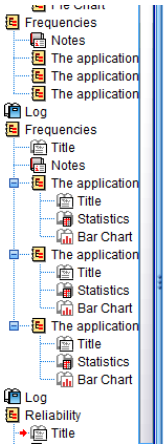
Case Processing Summary

		N	%
Cases	Valid	131	100.0
	Excluded[a]	0	.0
	Total	131	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.786	.788	6



Scale: Prospects of BSC Specific to Supply Chain Performance

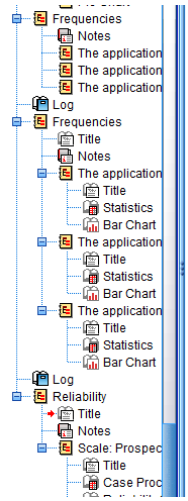
Case Processing Summary

		N	%
Cases	Valid	131	100.0
	Excluded[a]	0	.0
	Total	131	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.848	.846	3



Reliability

[DataSet12] C:\Users\DELL\Downloads\books\LSCM@Commerce\For Thesis-LSCM\Measuring Supply Chain Performane\BSC_Challenges.sav

Scale: Challenges of Balanced Scorecard

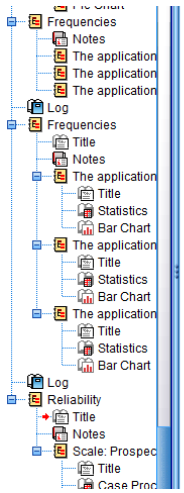
Case Processing Summary

		N	%
Cases	Valid	131	100.0
	Excluded[a]	0	.0
	Total	131	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.751	.752	8



Reliability

[DataSet14] C:\Users\DELL\Downloads\books\LSCM@Commerce\For Thesis-LSCM\Measuring Supply Chain Performane\BSC_Alignment.sav

Scale: Extent of Alignment of BSC Perspectives

Case Processing Summary

		N	%
Cases	Valid	131	100.0
	Excluded[a]	0	.0
	Total	131	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.771	.781	5